June 1979

Smithsonian

Tribalism, a divisive threat in Africa (p. 40); above, in Kenya, are warriors of the Samburu

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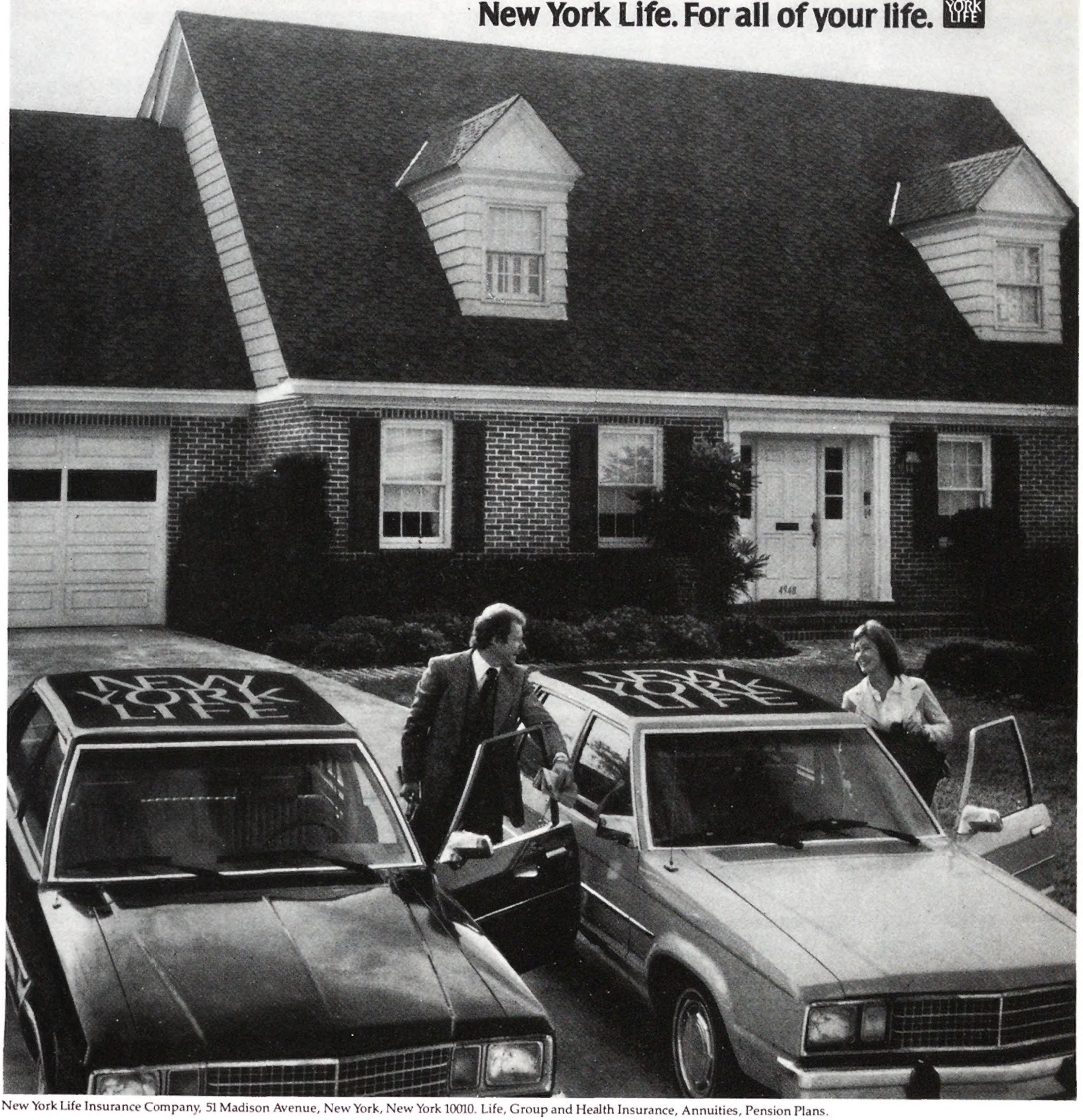

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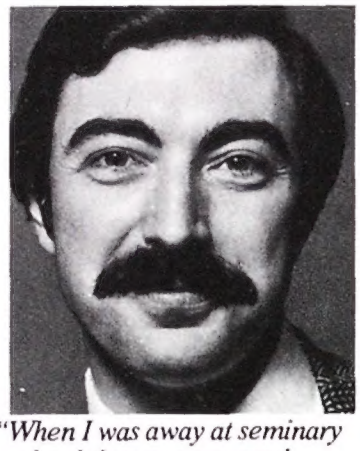

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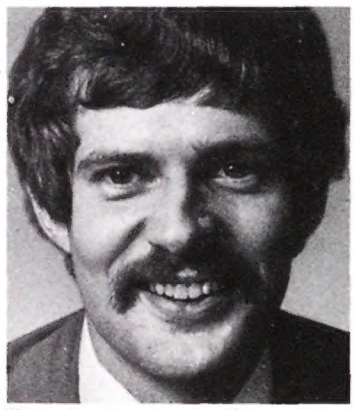

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Smithsonian (ISSN 0037-7333) is published monthly by the Smithsonian Associates, 900 Jefferson Drive, Washington, D.C. 20560.
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Subscription price $12 a year in U.S. and possessions, $15.50 elsewhere. Single copy price $1.25. Second-class postage paid at Washington, D.C. Editorial offices, 900 Jefferson Drive, Washington, D.C. 20560. Advertising and circulation offices at 420 Lexington Ave., New York, New York 10017. Please address all subscription correspondence and change of address information to P.O. Box 2955, Boulder, Colo. 80322

June 1979

Smithsonian

Volume 10, Number 3

Table of Contents

COVER: Samburu tribal warriors dance at Maralal during a national Kenyan festival (p. 40)
Photograph by John Reader

10 The view from the castle: Secretary Ripley's comments

12 Letters to the Editor

18 Picture credits

22 Around the Mall and beyond by Edwards Park

32 Phenomena, comment and notes by James K. Page jr.

40 Microcosm of a continental force: tribalism in Africa—past patterns and educational efforts to counter divisive threat
Article and photographs by John Reader

52 Researchers probe the mysteries of how birds navigate the skies, and are discovering some tantalizing clues
By David R. Zimmerman

62 A leading French art dealer, Aimé Maeght, created a superb showcase to display finest of contemporary art
By Robert Wernick, photographs by Pierre Boulat

72 A handsome, poetic design is wrought by Bradbury Thompson for a new three-volume Bible
By Doris Grumbach

82 New reports of the tracks of the Eastern panther, long considered extinct, stir up hope for its survival
By Michael Frome

91 The sky's the limit in a solar balloon
By Carol Havens, photographs by Vince Streano

96 Fighting one plague with another, the French save their chestnut trees, and raise hopes for America's, too
By Rudolph Chelminski, photographs by Pierre Boulat

104 For three-dimensional portraits, 19th- and 20th-century "sculptors" created an array of bizarre machines
By Michele Bogart

113 Rum-running gave Detroit a dim view of prohibition
By Larry Engelmann

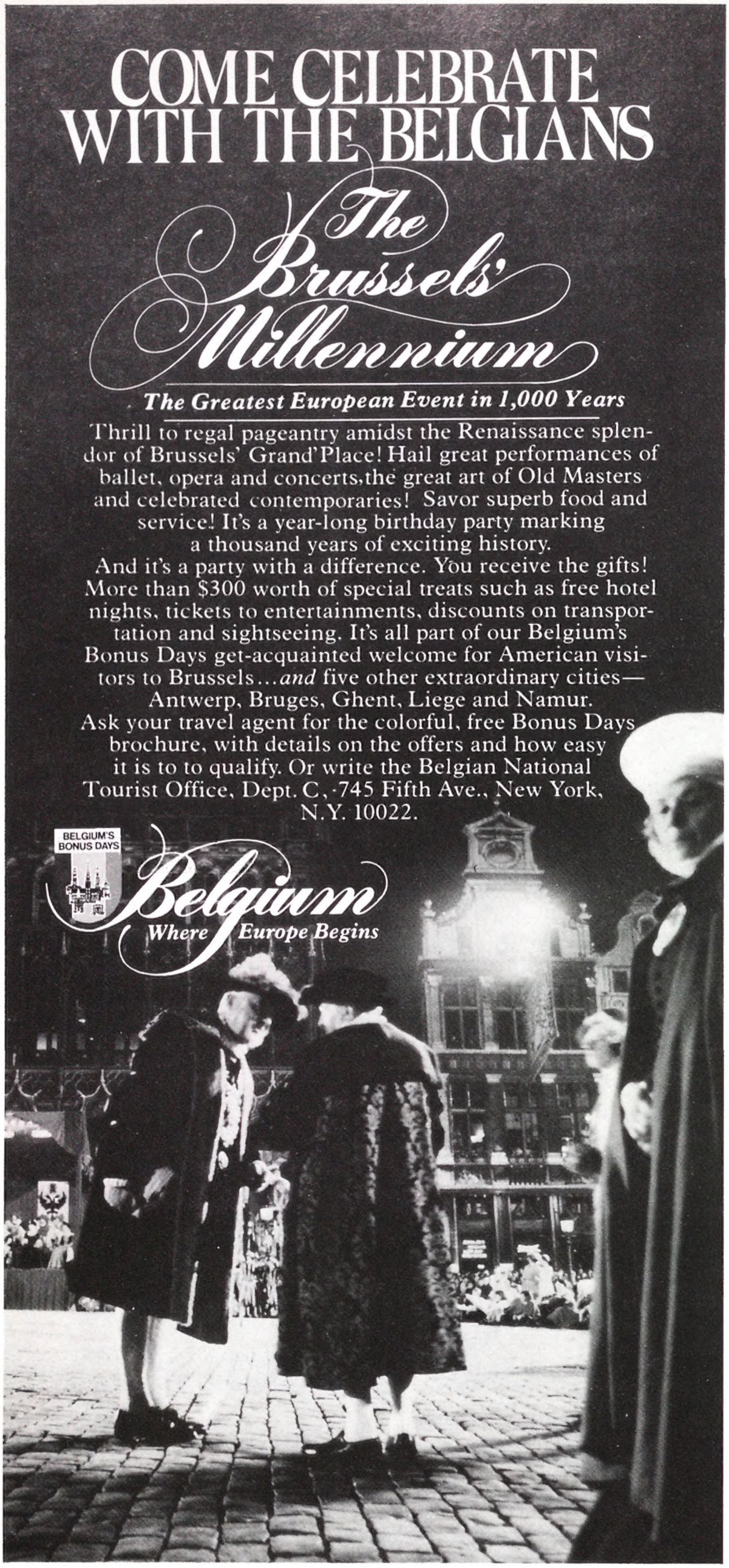
126 Book reviews

134 Additional reading

136 Smithsonian tours

138 June events at the Smithsonian

144 Are they birds or do we see W. C. Fields in triple vision?
By John V. Dennis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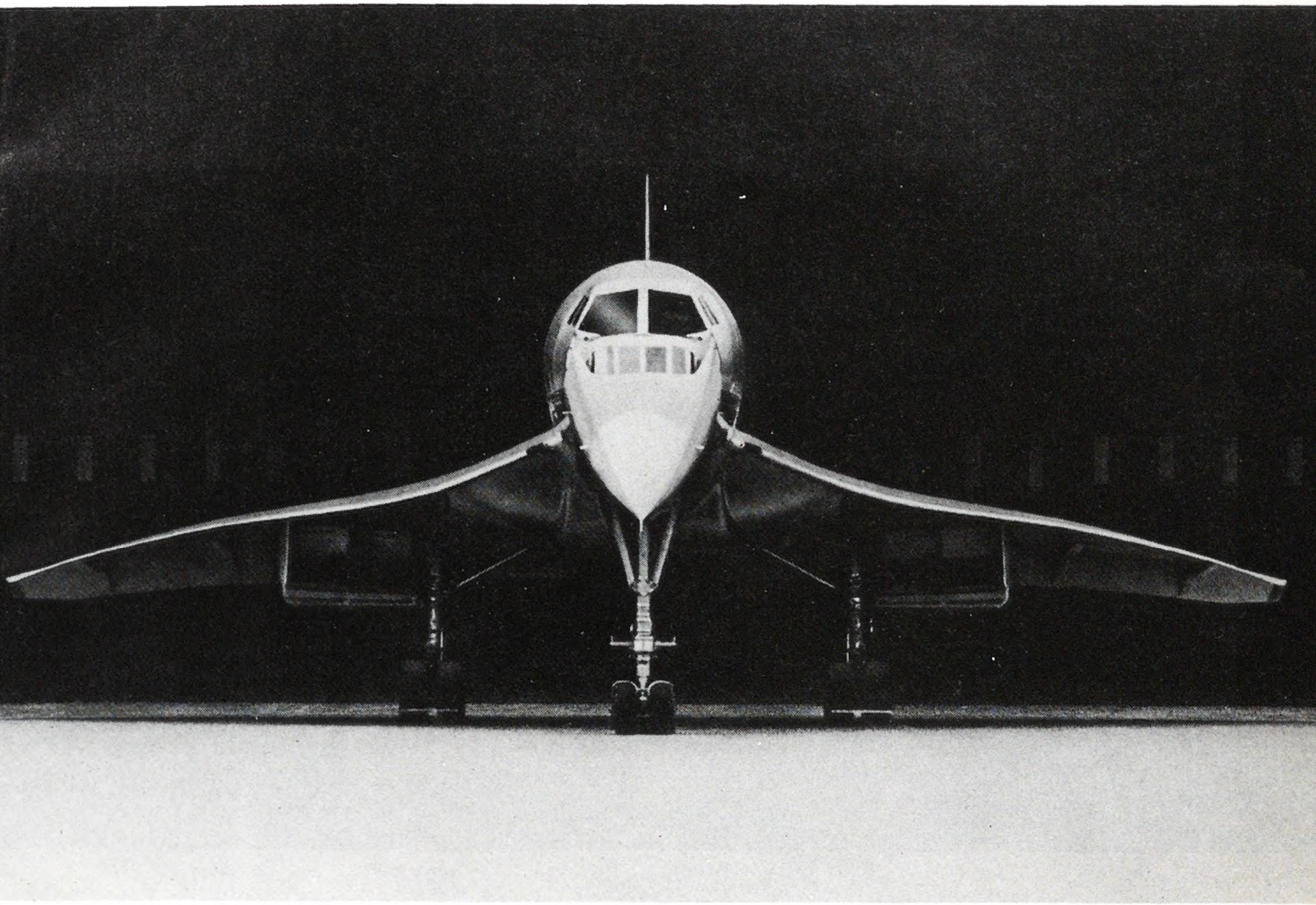

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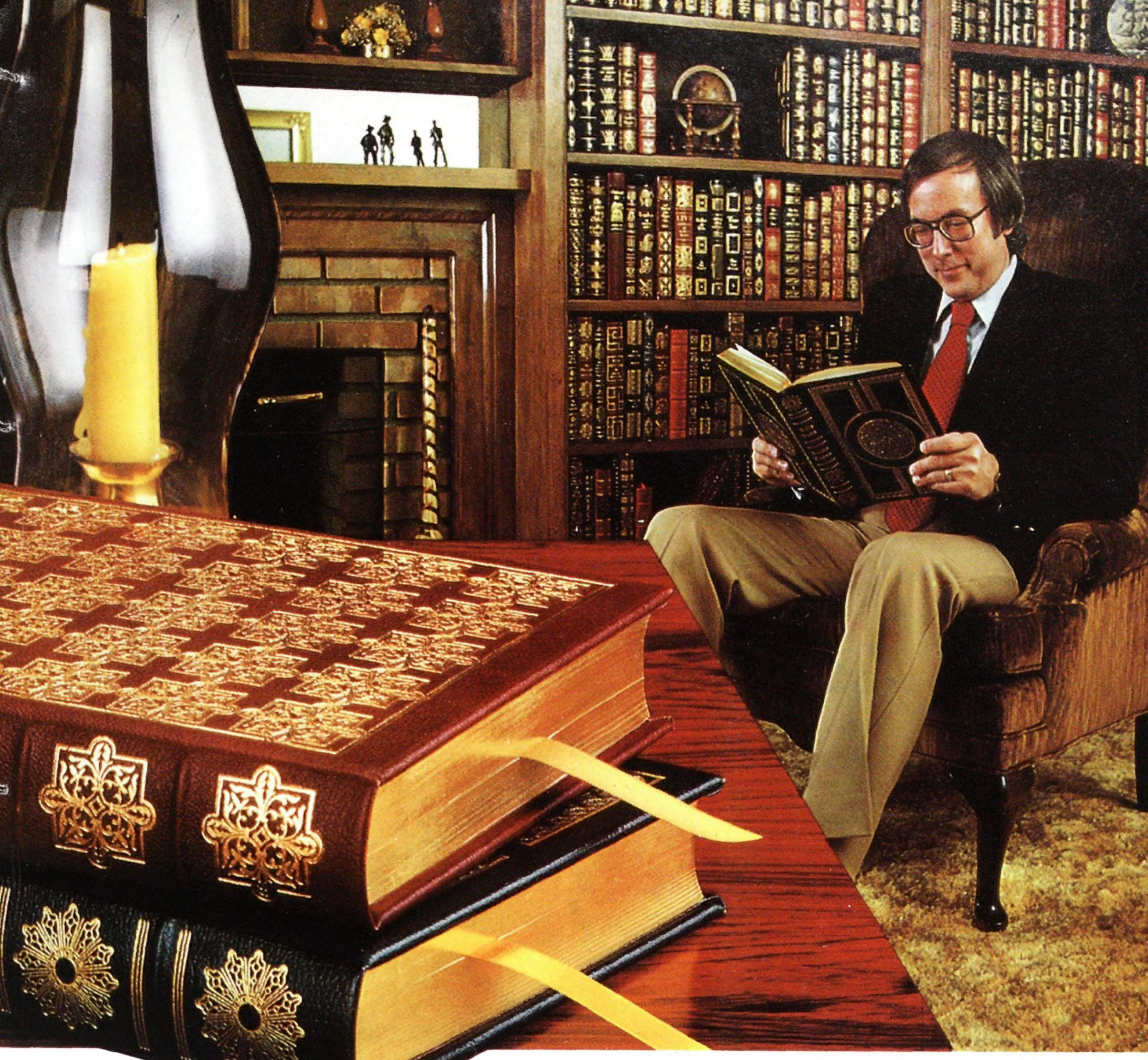

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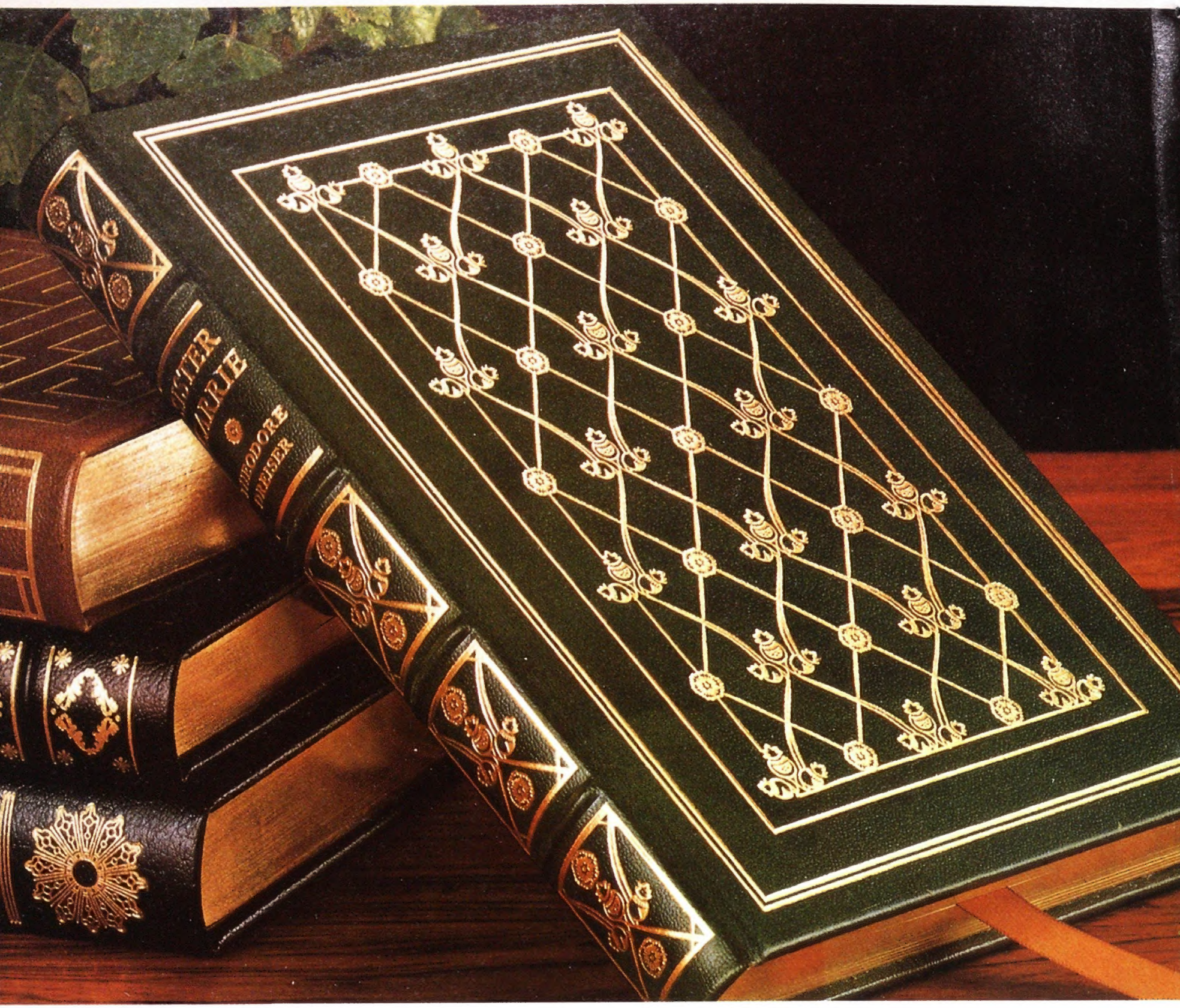

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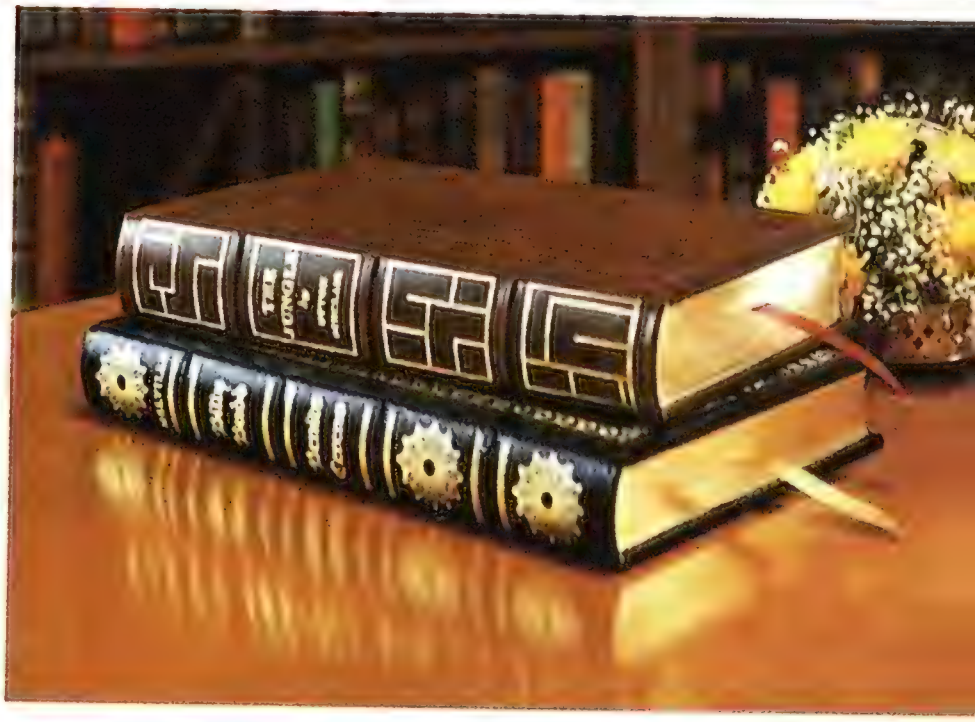

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Secretary Ripley's comments

The view from the castle

For many years there was a perceived lack in the United States, and in Washington, of a national pantheon. In such a place—which might have been called a "Hall of Fame" in an older age—likenesses of people who had played a part in the historical and cultural life of our nation might be collected and studied. Such an institution should be supported by the government, as are the Library of Congress and the National Archives, for its priorities would be the same: as a central historical archive of the likenesses of the men and women who made this nation.

Nearly 20 years ago, perhaps 100 years after it should have, the Congress passed a bill creating within the Smithsonian a National Portrait Gallery. It is still an idea that is not completely understood. Art museums are properly interested in portraits as works of art, but care less for the sitter than the artist. In a portrait gallery, the priority is reversed.

The Smithsonian in 1962 quietly took on the task of carrying out the intentions of Congress—with little in the way of funds or support, and too late to acquire many of the likenesses of those who have molded our national heritage; if they were locally famous or painted by famous artists, they had usually ended up in a local historical society or an art museum. But under its two able directors, Charles Nagel and Marvin S. Sadik, the National Portrait Gallery has nevertheless come into its own as a historical and archival museum of rare quality.

Since the beginning, our chief national heroes have proved to be the most elusive to obtain for the gallery. And so it has been with the Father of Our Country, George Washington. The Smithsonian had acquired certain memorabilia—his uniform, one sword, his headquarters tent, his china, even his false teeth—but the likenesses of the most famous Virginian of them all had ended up in a variety of places far older than the National Portrait Gallery. And, once there, they were unlikely ever to come unstuck.

Except for chance. Early in 1974, the Boston Athenaeum, a private library society whose paintings no longer hung on its own walls, offered to sell a number of them to the Boston Museum of Fine Arts, where they had been on loan for nearly a century. The Museum *did* buy nine of these paintings, for more than $1 million, but chose not to buy two noted portraits of George and Martha Washington by Gilbert Stuart, then valued at more than $1.6 million. Beset by operating deficits, the Athenaeum in 1977 once again offered the portraits to the Museum (the value, of course, had escalated) and the Museum once again declined.

In the meantime, the National Portrait Gallery had achieved a decade of visible existence in Washington. Most historians and scholars were aware of its charter, and the public and educators were taking advantage of its exhibits and publications. And so, for pictures of such appropriate significance, the Athenaeum turned for advice to the national repository where, under different circumstances, these portraits might otherwise long since have come to rest.

The Athenaeum authorities proposed a conditional offer of sale to the National Portrait Gallery. The price, still further increased through inflation, would have to be met by the Smithsonian. But if they were to leave Massachusetts, these historical likenesses *could* and *should* be deposited only in the National Portrait Gallery. It was thought essential that the trustees of the three institutions—Athenaeum, Smithsonian and Boston Museum—should find the terms of any such transaction acceptable, and that appropriate legal permissions be granted. In all this, the president of the Museum of Fine Arts concurred.

For eight months discussions continued, trying to arrive at a price that would be equitable to all, coupled with an agreement that for 50 years (and perhaps longer) the paintings would be returned to Massachusetts during one year in five. The Smithsonian Regents accepted the National Portrait Gallery's recommendation that $5 million be raised for such a purpose. The Athenaeum trustees agreed, apparently in the face of higher offers which had flowed in from other points of the compass. And, finally, the executive committee of the trustees of the Boston Museum of Fine Arts also approved.

At this point a hubbub broke out in the Boston press. Massachusetts' jewels were being purloined by the heathen in Washington, or so went the theme, and editorial writers and columnists took over and became engaged (with, for the most part, satire and good humor). The real facts flew out the window.

Let it be said here that Congress established the National Portrait Gallery for just such extraordinary historical documents, which are incontestably part of the national patrimony. Even though the paintings are now in Massachusetts (the painter was from Rhode Island, the sitters from Virginia, and the portraits painted in Pennsylvania), they still could be properly moved to the nation's capital, to be seen in a museum that belongs to *all* the people of *all* the states. After all, this city became the capital because it was neutral ground, and it did end up being called Washington.

S. Dillon Ripley

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Letters to the Editor

Roses

Dear Sir: Your April issue is a visual and literary pleasure, thanks to Farrell Grehan's photography and Maureen Green's article on the Meilland family and its generations-old association with the rose.

Griffith J. Buck
Professor of Horticulture
Iowa State University
Ames, Iowa

Dear Sir: Your article mentioned a rose named *Gloria Dei,* which was rendered in English as "Glory be to God." Actually, that is the translation of *Gloria Deo,* and the English should have been "The Glory of God."

Like the endangered species we read about so often today, Latin seems to be losing ground steadily, and that fact encouraged me to offer this only minor correction.

Monsignor A. V. McLees
St. Pascal Baylon Rectory
St. Albans, New York

The Peale family

Dear Sir: Lillian B. Miller's article about artist Charles Willson Peale and his family perpetuates a typical "ignoreance" of Peale's daughters, by merely mentioning their names—nothing more.

Since Peale actively encouraged his children's general education and, in addition, saw to it that "they were given a rigorous course in drawing," one might deduce that the daughters benefited as well as the sons.

The author need have looked no further than the Philadelphia Museum of Art to have found Sophonisba Peale's "Star of Bethlehem" quilt—one of the finest examples in this country. This work of art [see below] speaks eloquently of Sophonisba's share of the family talent.

Winifred Reddall
Santa Rosa, California

Sophonisba's patchwork quilt

Dear Sir: The setting for *The Artist in His Museum,* the opening picture in your article, is the Long Room on the second floor of Independence Hall, to which Charles Willson Peale transferred his historically famous collection in 1802. Today's visitor can admire this beautiful Colonial room extending the 100-foot length of the building, much more commodious than anything to be found in Philosophical Hall. Peale occupied the Long Hall until the year of his death, 1827. A number of portraits from the Peale collection are permanently displayed in what is now known as the Second Bank of the United States Building, the earliest having been purchased at auction in 1854 by the city of Philadelphia when the Peale gallery was sold off.

John Baxter
Waverly, Ohio

Dear Sir: The author might have mentioned another equally talented and successful Peale artist. Sarah, daughter of Peale's brother from Philadelphia, might well have been listed because she received instruction in oil painting from her cousin Rembrandt, and both she and her sister Anna were invited to show their work in the Peale Museum in Baltimore.

In 1825, Sarah finally settled in Baltimore and advertised as having "painting

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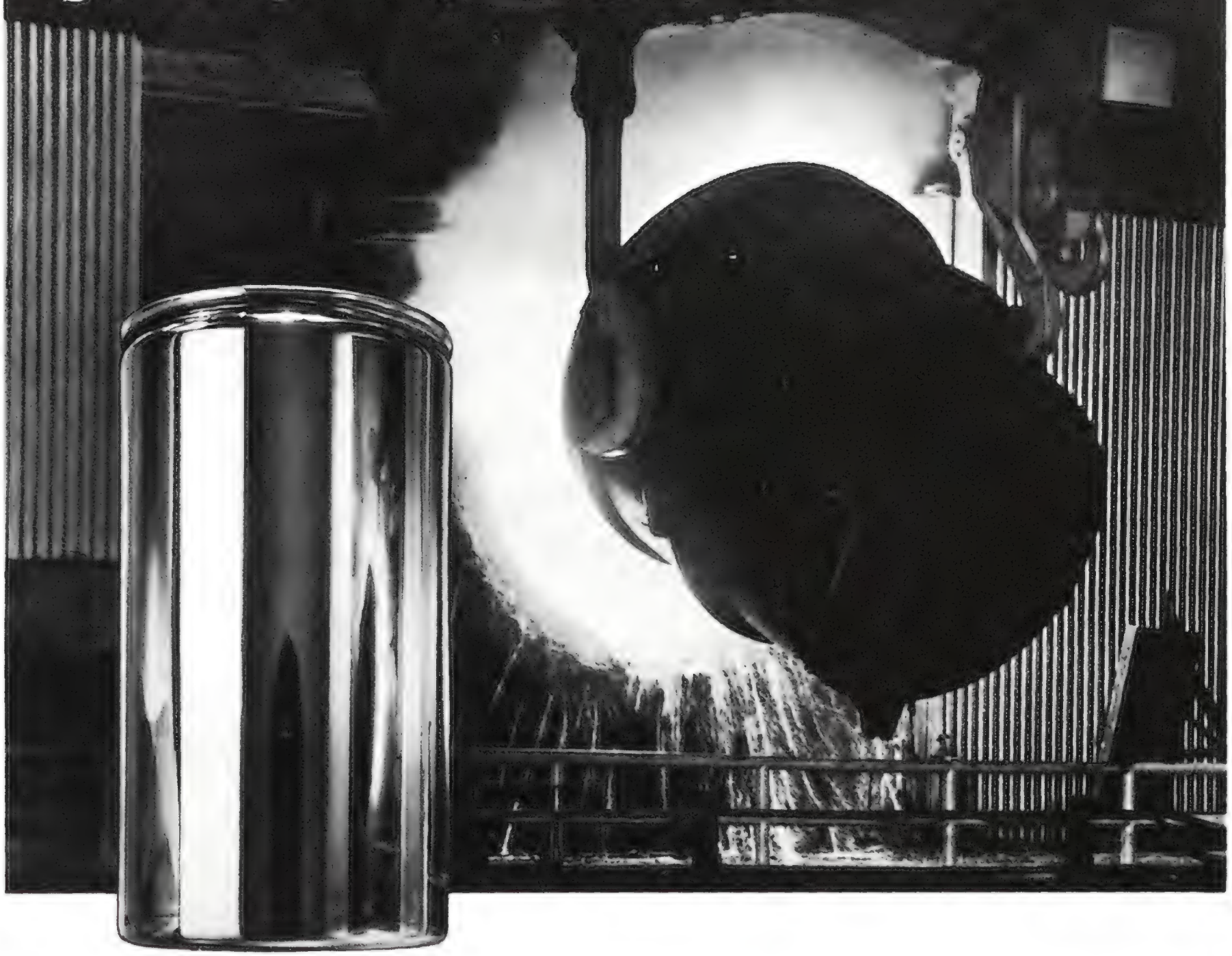

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rooms in Peale's Baltimore Museum." After it closed, she opened her own studio and received more than a hundred portrait commissions from the city's leading citizens. According to Eleanor Tufts in *Our Hidden Heritage,* an art book documenting the lives of neglected women artists, Sarah Peale's style of painting was "very similar to that of the rest of the family . . . a straightforward, austere directness that resulted in a realistic representation . . . ."
Claire Masters
Lafayette, California
Sarah Peale was indeed a talented artist, but the article dealt only with Charles Willson Peale's immediate family. Ed.

Dear Sir: Your article on the Peale family was both interesting and informative, but I believe your reference to Maryland being a royal Colony at the time of Peale's birth in 1741 is in error. It was a proprietary Colony.
Philip A. Ridgely
Washington, D.C.
Maryland was a proprietary Colony from 1632, when Charles I of England made the grant to the second Lord Baltimore, until the Revolution, except for the period 1691-1715 when it was a royal Colony. Ed.

Air and Space exhibition

Dear Sir: As an Air Force pilot, I was fascinated by the aerial views in Edwards Park's article on a new Air and Space exhibition. It might be interesting from a historical viewpoint to note that the low-altitude photograph of missiles sitting on their launchers in Cuba does not portray the actual missiles of "Cuban missile crisis" fame. The weapons that gave their name to the 1962 confrontation were Russian Intermediate Range Ballistic Missiles, presumably with nuclear warheads. What the photograph shows instead is an array of fully operational antiaircraft missiles, sited to defend the much larger nuclear missiles and their launch sites. It turns out they are Soviet-built SA-2 Surface-to-Air Missiles laid out in their distinctive star-shaped emplacement. At the star's center is the radar equipment used to track target aircraft, such as the RF-101 Voodoo reconnaissance plane that took the photograph.

Later during the crisis, after President Kennedy had revealed the missiles' presence to the public, one of these SA-2s was probably responsible for the shooting down of an American U-2 reconnaissance plane over Cuba.
Thomas D. Jones
Fort Worth
Lt. Jones is correct that the antiaircraft missiles in the photograph are SA-2s protecting nuclear missiles, not shown. A similar SA-2 site was responsible for the death of the U-2 pilot, USAF Major Rudolf Anderson jr., on October 27, 1962, at the height of the crisis. The photograph was the one President Kennedy chose from 125 miles of footage recorded over Cuba to hang on his office wall. Ed.

Western art

Dear Sir: The First Western States Biennial Exhibition that Bill Marvel wrote about will have a significant national tour, and we were especially proud to have it open in Denver. It has focused much attention on the dynamic cultural activities that are happening in the Rocky Mountain region.
Susan Landess
The Denver Art Museum
Denver, Colorado

Maladies of work or play

Dear Sir: Paul Trachtman's article, "Monday Head to Tango Foot (and worse), it's sick, sick, sick!" is most amusing. I'd like to add a few more examples: trial lawyers get Lawyer's Larynx Lustitis; radio repairmen, Ocular Exaggeratitis; writers, Wrist Hyper-Typistitis; elevator operators, Upperitis and Downersartoritis; tongue-in-cheek readers (and writers) get Inside Cheek Blisteritis.

Having contributed to the Social Security program for many years, I have Social Securus Dependonitis (a social disease) while those on government pensions complain of having Governus Pinch Nervitis.
Milton Lowenstein
Alexandria, Virginia

Dear Sir: While treating my broken ankle, my doctor warned me about Crutch Palsy—caused by using crutches a little too long for your height.

Your reference to Weavers' Bottom made me wonder if this unfortunate condition doesn't antedate the Industrial Revolution. Remember Shakespeare's

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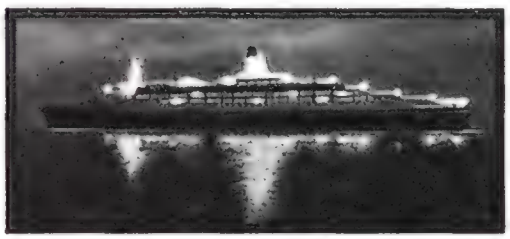

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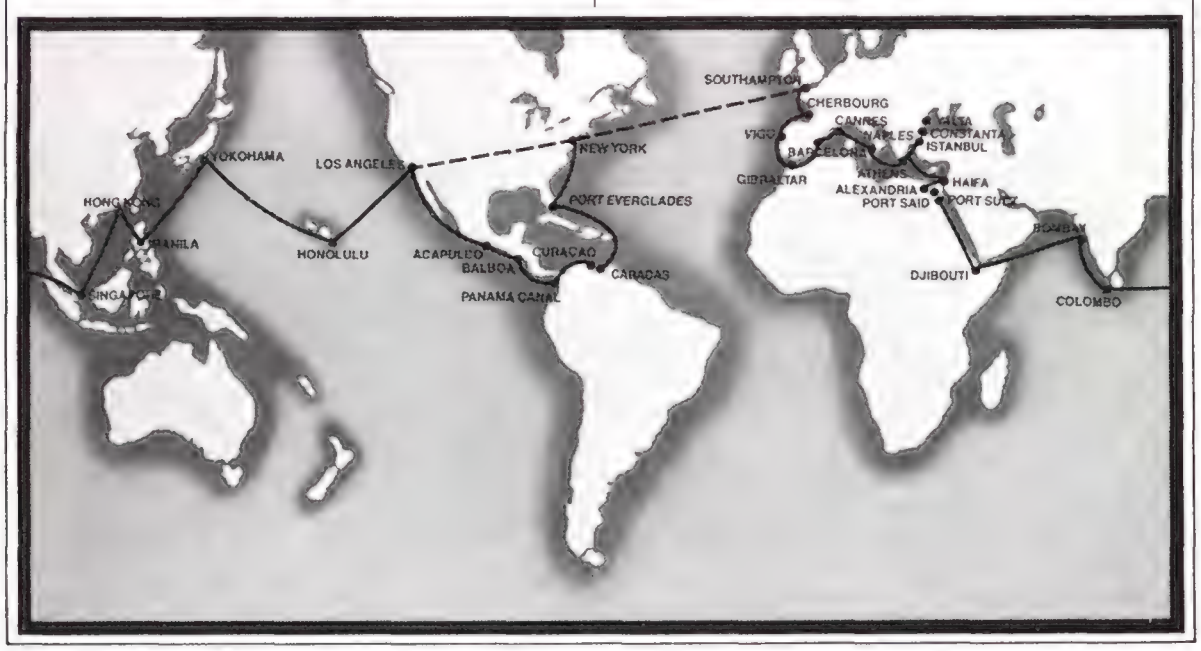

weaver in *A Midsummer Night's Dream* was named Bottom.

Aloise M. Bell
Falls Church, Virginia

Dear Sir: Paul Trachtman refers to the 1924 diagnosis of "Listening-In Dermatitis, from excessive contact with the earpiece," which, he suggests, was caused by eavesdropping "when the party line was a well-established institution."

It was in that year that my husband and I invested in a radio—that miraculous little box, with the controls on top, and earphones. It's surprising that I, who get dermatitis from earrings, did not contract it that summer, for I spent countless hours wearing earphones listening to the roll calls at the Democratic National Convention from Madison Square Garden.

Other survivors must remember how each began with a sonorous "Twenty-four votes for Underwood." John W. Davis (on the 103rd ballot), not Al Smith, got the nomination—the nation got Coolidge.

Ruth vonPhul
New York City

Mike Fink

Dear Sir: There is another version of the Mike Fink legend that deserves equal time. Indeed, he was a holy terror of a keelboatman, but there is doubt that he was ever in New Orleans. Some of the criminal exploits of Bill Sedley may have been attributed to Fink. Sedley's barroom brawl cry, known from St. Louis to the Swamp in Girod Street, was "I'm a child of the snapping-turtle, I am!"

Herbert Asbury wrote in *The French Quarter:* "Among the flatboat men heroes appeared whose names soon became legend and whose exploits, improved and enlarged upon at each telling, approached the fantastic. Mike Fink was the most celebrated of these giants, and in the course of time he was so enwrapped in tradition that he became a combination of Samson, Ulysses, Paul Bunyan, and Jack the Giant-Killer. . . . Mike Fink was an Ohio River man and exercised his peculiar talents principally on boats operating between Cincinnati and Louisville. There is no record that he was ever south of St. Louis, and in the lore of New Orleans he is known only by hearsay."

Gerald M. Bastarache
Falls Church, Virginia

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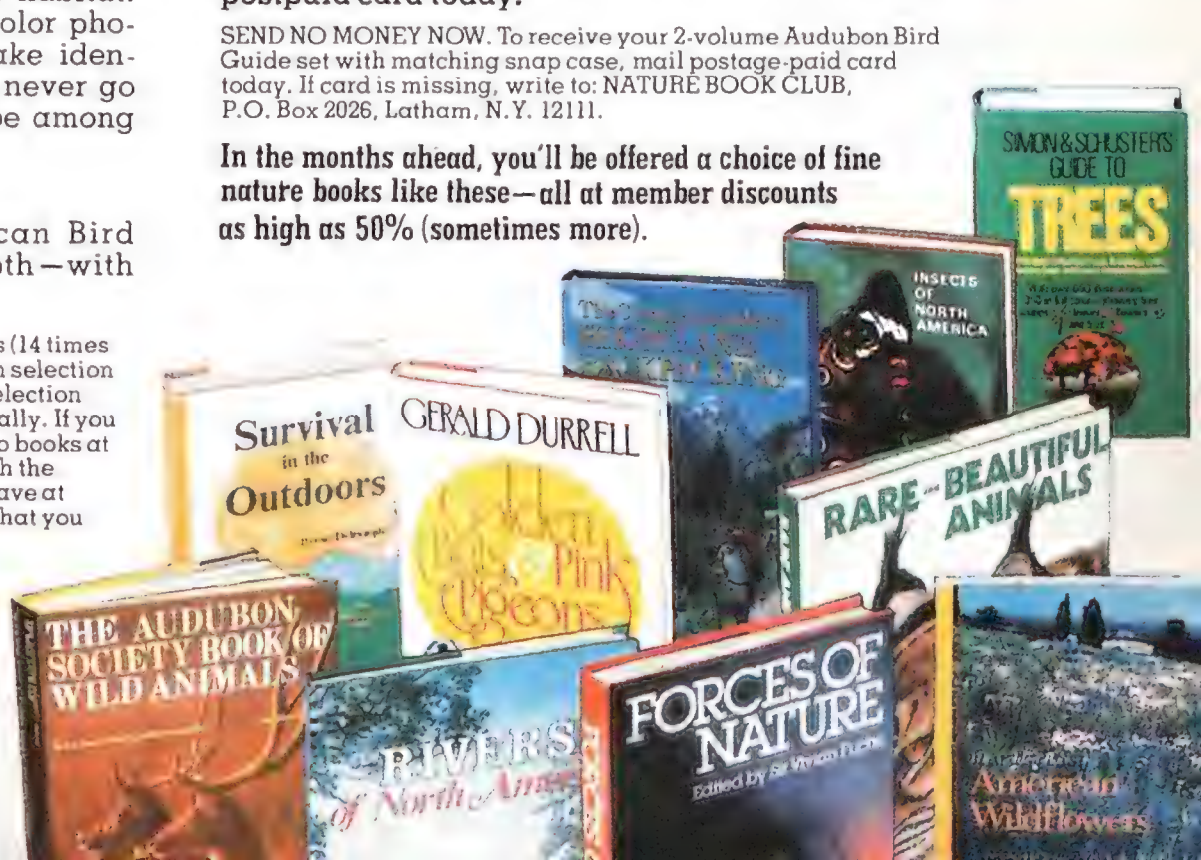
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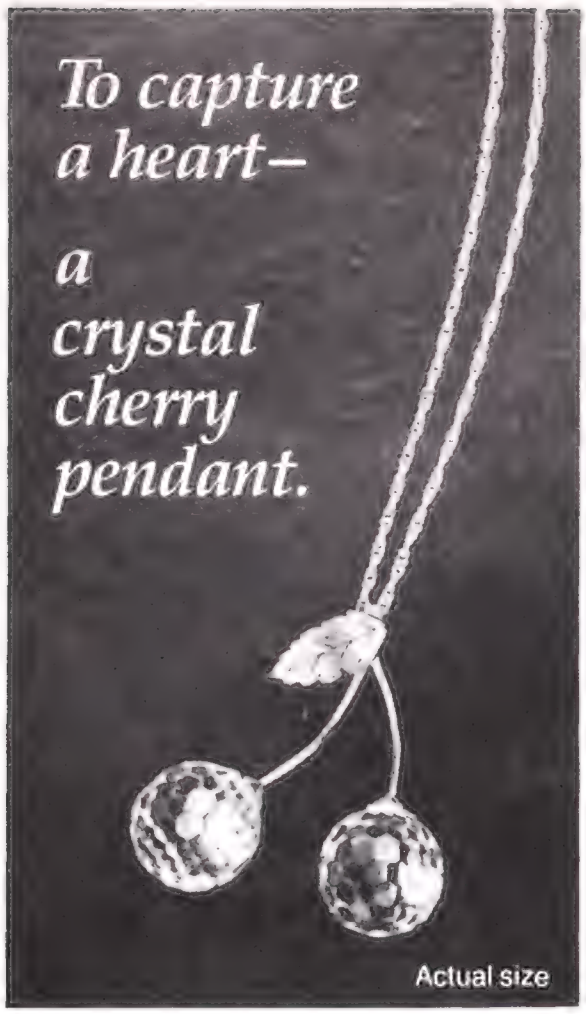

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Mike Fink was ever in New Orleans, but boastful stories about his exploits there abound. His name was legendary there, and all the way to Pittsburgh. Ed.

Phenomena, comment and notes

Dear Sir: James K. Page's comment on my recent paper in *Science* incorrectly states that I went to New Zealand (presumably at Cornell's expense) to collect pebbles to prove the obvious. In fact, I am a New Zealander (presently a Fulbright-Hays scholar at Cornell), and I measured the pebbles as part of my New Zealand PhD—the fieldwork costing about $20. Although perhaps obvious to Mr. Page, geologists still don't agree that abrasion accounts for all downstream pebble changes, and the history of science shows that the obvious is sometimes not the truth.
John Adams
Ithaca, New York

Dear Sir: So Babe Ruth "couldn't possibly play today's baseball!" Does Mr. Page also think Shakespeare couldn't get his plays published, Milton his poetry printed, Beethoven his music played? Take it from an old sports writer who covered baseball in the Ruthian era, the Babe would dominate the game today as completely as he did then.
A. Charles Corotis
Moorestown, New Jersey

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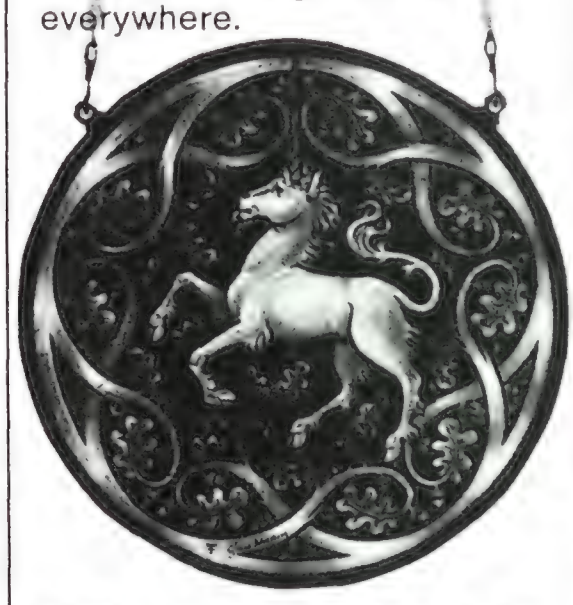

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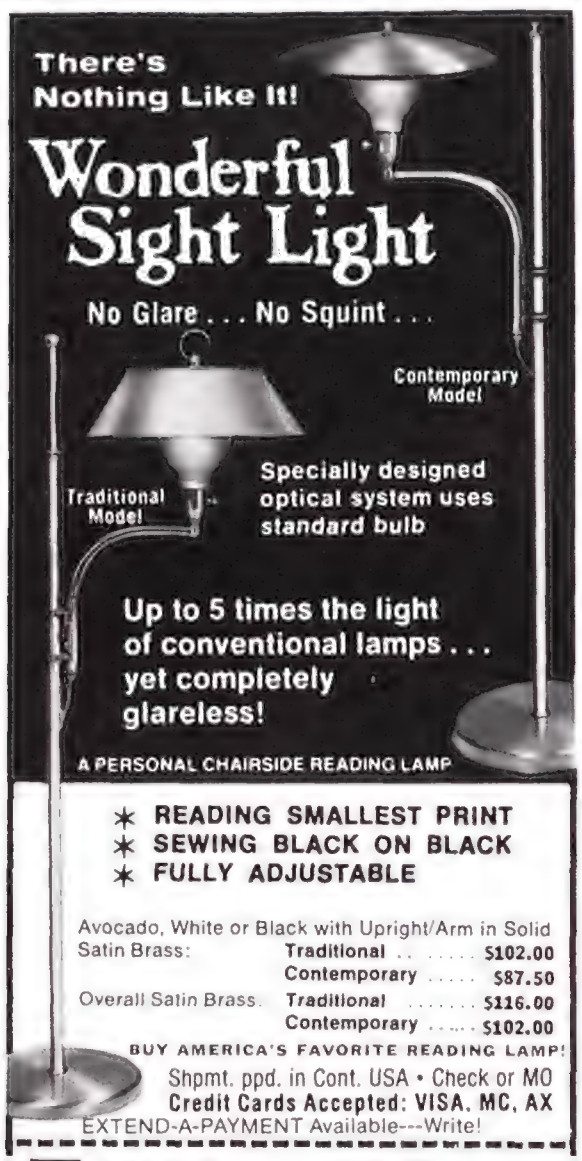
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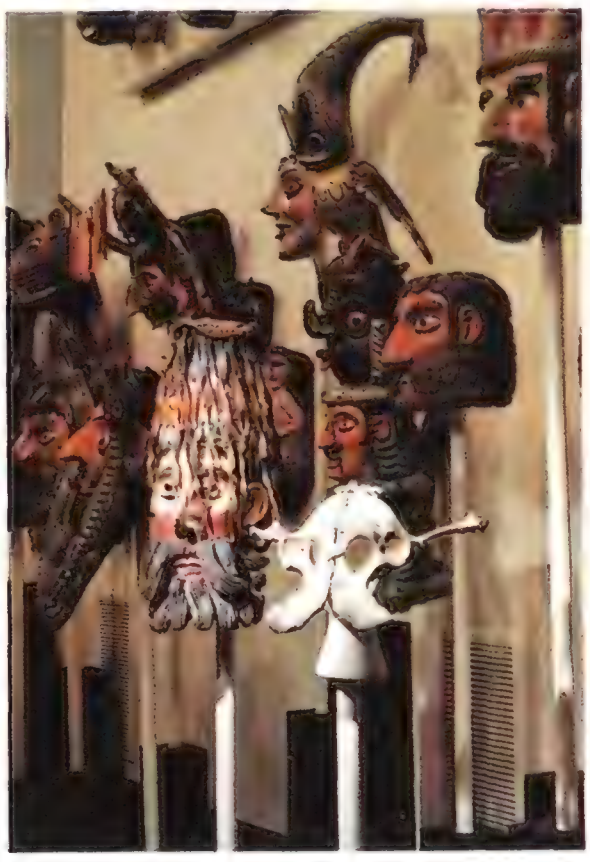
Around the Mall and beyond

The Museum of Natural History has set up an exhibit of Mexican masks, of which you see, below, a part. It's on the third floor, beside the South American gallery. Beside it, that is, at the end *away* from the rotunda. . . . Oh, hell, I can't ever find anything in that museum without getting lost, so you'd better ask a guard—an experienced-looking one.

The masks, from the collection of Donald and Dorothy Cordry, were worn for the ritual dances and processions that are an important part of Mexican village life. They reflect the strange and sometimes amusing ambivalence toward Christianity that is noticeable in all Latin America wherever Indian cultures hang on. It's as though Christianity were a very thin veneer, and underneath you can make out the grain of the real wood.



Here you see masks to be worn for the Dance of the Crocodile or the Dance of the Fish, and there are masks with snake or lizard motifs which have special significance. Then there are masks worn when you celebrate a saint's day or a Spanish commemoration. These are apt to have beards and crowns and curly hair.

Anthropologist Bob Laughlin, who oversees this collection and explained it in the accompanying panels, points out that the masks indicate good guys and bad guys. When Mexicans dance out a moment of history like the Spanish defeat of the Moors, the Spanish all look pretty decent and upright while the Moors look evil—like the mask in the photograph with the sneery face and the rawhide hair. Similarly, in Biblical dances Christians look clean-cut, and people like Pontius Pilate seem wholly untrustworthy.

But there's a nice touch: when they dance the story of the conquest of Montezuma, the conquistadores under Cortés look absolutely rotten, while the Aztecs glow with virtue and courage. First things first, it says here.

After last winter's enormous snow, spring struck Washington with sudden and delightful vehemence. Nowhere, perhaps, was this more apparent than at the National Zoo.

I drove over on one of the first bright, warm days to have lunch with some friends at FONZ (that's Friends of the National Zoo, for those who don't see our local bumper stickers) and found that the birds had got quite out of hand, and God knows what the bees were up to.

Peacocks were displaying themselves gloriously and interminably, waterfowl (male) were hysterically pursuing waterfowl (female), some other little twig-perchers I couldn't identify were quite blatantly necking and, as for the ostriches, well, I haven't seen such brazen disregard for Victorian sensibilities since I passed along the banks of the Thames in a riverboat on one of those long, soft, spring evenings that England sometimes turns on.

Accompanying this perfectly outrageous behavior was a deafening concert of spring calls by every bird who can make any noise at all. I found one of the champions was the white-bellied sea eagle

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(Haliaeetus leucogaster), which periodically cut loose with a series of shrieks piercing enough to set atremble the very walls of the nearby bird house. His cries inspired the other champ, the red-legged seriema *(Cariama cristata)*, who stretched his neck, flung back his head, closed his eyes in vernal ecstasy, opened his beak and produced a sound that would have sent you to your patented bomb shelter back in the Cold War days.

Ears ringing, I studied the information about these two and found that the sea eagle shouts his way around India, southern China and Australia, while the seriema rouses South America from its siestas. Between them, on this fine, joyous day, they raised the decibel count at the zoo to that of your local jet fighter base.

Spring so titillated me that I became unusually compulsive about attending Smithsonian openings and seeing things I had overlooked in the gloom of winter. I darted from museum to museum with the frenzy of a sparrow during mating season. The Renwick, for example, opened its exhibit of "Buildings Reborn," and I was there to gape at photographs of 53 old building projects and see how they are finding uses that will guarantee their survival for, we hope, centuries to come.

Here I spotted a Boston mansion that I remember from my youth: the Ames-Webster House on Commonwealth Avenue. This private residence was grand even in its heyday, when carriages rolled up to its door for discreet—outwardly, at least—celebrations of proper Bostonians. I think it was already vacant in my small boyhood, for I recall peeking through gaps in the heavy curtains at the great downstairs windows and seeing acres of richly carved wood gleaming dully in the half-light. Nothing stirred inside.

My schoolmates and I were seduced into playing trench warfare (a big deal in my day) in the areaway—five feet below pavement level, and no indignant butler to shoo us off. Passing neighbors, however, regarded us with such hostility—the quietly seething kind that Back Bay Bostonians are good at—that we unfixed our imaginary bayonets and slunk away through Flanders mud to an estaminet well behind the lines.

Today, the Ames-Webster House is an office building, vibrant and tingling and safe from the wrecker. And I hope its bright, lovely girls and keen, spirited

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young men make Bostonian passes at each other whenever spring comes around to Commonwealth Avenue.

Another building that the Renwick honored was the Renwick itself, whose restoration was indeed a sort of miracle here in Washington. But I was more intrigued by the photographic possibilities of this display. If only there had been an interior shot showing the "Buildings Reborn" exhibit and focusing on the coverage of the Renwick with an interior shot of the Renwick with an interior shot of the "Buildings Reborn" collection in which, if you looked carefully, you would see photographs of the Renwick and the "Buildings Reborn. . . ." and so on and so on.

To dodge such madness, I investigated the neighboring Renwick exhibit of the gold and silver smithery of Olaf Skoogfors, the Swedish-American artist who died too young in 1975. I admired his pendants and brooches and coffee pots and bracelets, and then I spotted a whole series of belt buckles. They were big, husky, functional belt buckles, rich with bronze, brass and silver designs. You can picture them being worn by Ted Turner at the helm of an *America's* Cup defender, or by a leathery cowpoke advertising cigarettes, or by our friend Muhammad Ali, come to visit his gloves and robe in the Museum of History and Technology.

It's not often that an exhibit of jewelry includes something as masculine as belt buckles. Usually, men view jewelry with appreciation mixed with furtive gratitude (or dismay) that their wives are not (or are) present to be reminded how damn few nice things they've been given during X years of everyday marriage sacrifices. But here was something for the boys.

My only worry was how to wear a Skoogfors belt buckle. If you can afford it, you're doubtless an industrialist or a broker dealing in oil stocks and you wear a suit and vest and never *ever* show off your belt except in a state of comparative deshabille. If you're a young swinger who goes about in tight jeans with your shirt open to your navel, you would certainly show off your belt buckle to great advantage. But you can't afford it.

I guess what you do is to be rich and wear it under the old 750-buck pinstripe, secure in the knowledge that it is there. Think of the stone carvers of European Gothic cathedrals who would render fine sculptures on the backside of a figure or

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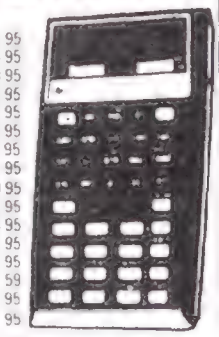

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Bushnell Give Us A Look

decorative column. No mortal eye might see them, but the carver may have thought his artistry was raised to a divine level. Similarly, by wearing a Skoogfors buckle under your vest you will pick up a dollop of hubris. For only you and God will know what keeps your pants up.

Both of the Renwick shows last until August 19. The new film at the National Air and Space Museum will presumably go on through the summer of 1980. Not that its spectacular predecessor, *To Fly*, has been retired. It's still heavy artillery for that museum and starting this month, if public interest warrants, it will be shown a few times daily.

The new film is another production in the 70-mm IMAX format. The picture fills the giant screen at the NASM theater and its producer is Francis Thompson, who also made *To Fly*. The director, Dennis Earl Moore, used IMAX to do *American Years*, a Bicentennial film for Philadelphia. Again, the spectacle is gigantic yet intimate, with every detail perfectly sharp, a difficult achievement on a huge screen.

Living Planet is a sort of visual hymn to Earth. Its verses take us from space into ocean, jungle, desert, glacier, mountains and urban scenes. It moves in time, too, from primordial stirrings of life to space walking. And it changes focus from views of grand vastness to drops of water forming and falling. Sure, there are planes in it—for one wonderful sequence the camera is fastened somehow to the vertical stabilizer of a jet transport. But one of the great scenes is a look down at stampeding wildebeest in the Serengeti, and another comes when we drop right into a thunderstorm. Clouds boil around us, lightning crackles and the thunder goes off like a cannon blast in the speakers to your right and then ripples right across the back of the theater through every speaker in that multiple system. You're in the middle of the storm, all right, hair standing on end as you wait to get zapped.

On the way out of the Air and Space Museum I checked up on Orville Wright, lying there in control of the Wright Flyer. I did this because a five-year-old from Arkansas told his grandparents that he was mightily impressed with the way we had stuffed Orville and got him up on that wing.

He's right. It's a darn good job.

—Edwards Park

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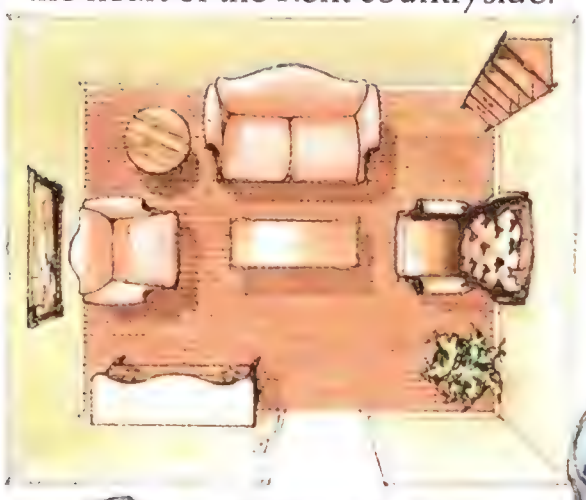


The Drawing Room

There are five people in the manor house.

Although no one knows it, The Crown Jewel of England is about to be taken.

The Contessa is whispering to the Squire.

The man in the heavy boots sits holding his favorite drink - a Beefeater Gin and Tonic.

The person seated opposite the Brigadier is enjoying a Beefeater Gimlet.

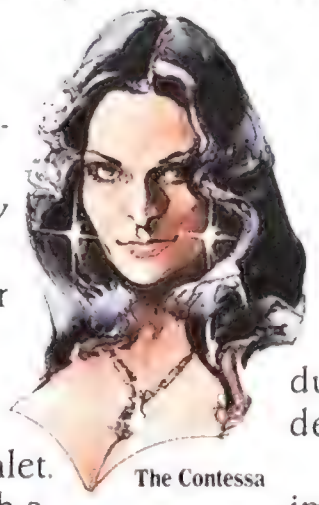
The Butler enters with a Beefeater Gibson for the person seated to the right of Lady Trumbull.

The Brigadier mumbles to himself to buy a bottle of Beefeater Gin - The Crown Jewel of England - on the way home.

Suddenly, the lights go out.

The Butler

Lady Trumbull



The Contessa

The Gibson Girl swoons into the waiting arms of the Martini Man.

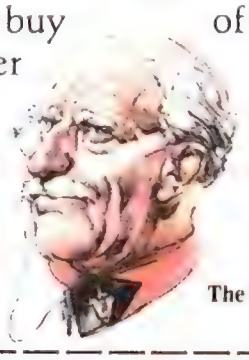
Lady Trumbull faints.

No one could hear any footsteps.

It should be easy to deduce who turned out the lights, dear reader.

But now, more importantly, clip out the coupon and tell us (for a chance at $25,000) who takes The Crown Jewel of England. That is a far trickier problem, and no one, not even you, is above suspicion. Good luck and good hunting!

The Squire



The Brigadier

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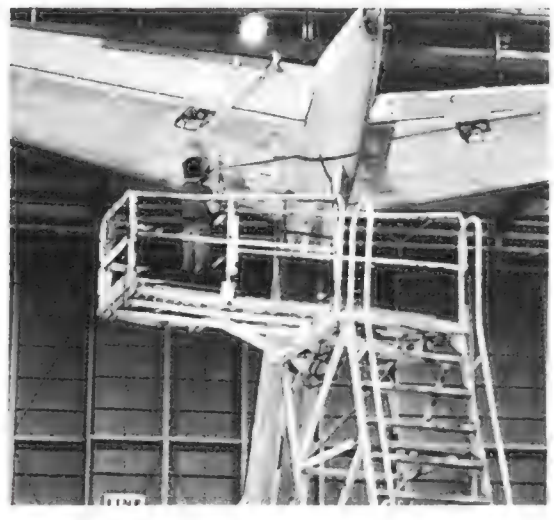

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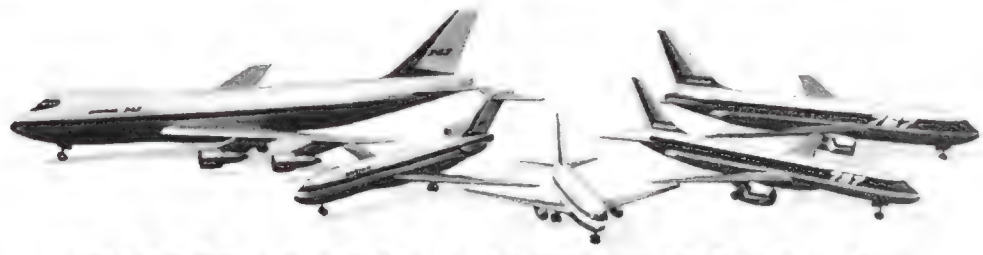

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Phenomena, comment and notes

Some thoughts on Three Mile Island, blue food, coffee with lumps, tea with hail, and some green polar bears

Imagine the consternation of the folks at the San Diego Zoo when they discovered that three of their polar bears were turning green. White tigers are one thing—a result of selective breeding (see SMITHSONIAN, April 1971)—but not unattractive. But green polar bears are something like blue food: yecch!

The first thought was that some kind of alga was growing on their fur, encouraged by "nitrogenous wastes in the waters of the bears' pool." But this turned out not to be the case, report Phillip Robinson of the zoo and Ralph Lewin of the Scripps Institution of Oceanography, in *Nature* (Vol. 278, No. 5703). There were algae present, but *inside* the bears' hair.

The hairs of the outer coats of polar bears are hollow, the air providing extra insulation. And running off the long, hollow tubes are lateral ducts, the researchers found, with some of them extending to the outside of the hair. It is in the lateral ducts, unique among mammal hair, that the algae were growing. Elaborate culturing showed that the interloper was a primitive, freshwater, blue-green alga (perhaps a previously unidentified species) that had grabbed the wings of happy chance when these exiles from the north arrived to provide them with "a habitat [that] has certain advantages, being warm and protected from most kinds of potential predators."

This phenomena may call for a wholly new biological term. The alga isn't a par-

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WORLD COMMUNICATION

The Craig Translator is truly a pocket-sized translation computer that will help you communicate in practically every major nation in the world—even if you don't want to learn the language. There are a series of numbers listed on the back of the computer which correspond to 50 of the most commonly used and most practical phrases. 25 of the phrases are complete statements such as: "How much does this cost?" The remaining 25 statements require one or two additonal words like: "May I please have the..." You simply press the number for the phrase you want and then enter the missing word on the keyboard which has keys with both letters and numbers.

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Learning a language is not easy, and the Craig Translator is not a substitute for practice and hard work. The Translator is, however, a very valuable teaching aid—one that can accelerate the learning process and teach you more vocabulary faster.

The most rewarding aspect of learning a language with the Craig system is "memory retention." When you need to know a word and can look it up at that very moment, your chances of remembering it are several times greater than in a classroom environment.

The Craig Translator not only gives you the answer, it does so immediately—at that moment—so it provides a very useful learning function. And it's fun to use and carry with you all day long.

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FOUR TEACHING SYSTEMS

The Craig's four reinforcement systems are:

Frequency You can sort out words by how frequently they come up in normal conversation and then learn these words. Each one will be flashed on the display for a few seconds, and you say aloud the correct translation.

Spelling A word is flashed in English and you guess the spelling of the foreign word which you then enter on the keyboard. If you enter it wrong, the unit tells you and then flashes the correct answer on the display.

Category You can learn by category. Select a subject and access the associated words alphabetically. If you are preparing for a trip, you can learn all the words that relate to travel.

Alphabet You can learn by the alphabet. Start at any letter and the unit will display all the words that start with that letter.

ALL THE ANSWERS

There are other features that make the Craig Translator an outstanding teacher:

Spelling Program If you enter a misspelled word, the display will flash a question mark. By pressing a key, you instruct the unit to find the correct spelling. On the display will flash a series of words it thinks are the correct ones, and you simply select the right one.

Double Meanings When you enter an English word that has two meanings in the foreign language, the unit will ask you which meaning by listing the possible choices. Again you select the right one by pressing a key. For example, "watch" would be two different things depending on whether it was meant as a verb or a noun.

MEMORY CAPSULE

The Craig Translator will accept other data so that eventually you will be able to store complete dictionaries, recipes, calorie equivalents, useful statistics, and other learning programs and then display this data on your pocket-sized information retrieval system.

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MANY PERSONAL USES

If you are a language student or a frequent traveler, the Craig Translator would be the perfect companion. That might appear obvious. But what about the shop owner who has to communicate with people from other countries? Or the grandparents looking for the perfect gift for a young high school student learn-

(Continued on page 134.)

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asite because it doesn't, so far as is known, render the host ill. And it's not a case of symbiosis (like the bacteria in us which help out with digestion in return for room and board), since the bears don't seem to gain much from it. Indeed, as zoo-exhibit animals they lose. Perhaps they should hire a lawyer.

Blue food

The business about blue food, by the way, is straight from General Foods, which should know about that kind of thing. The information came to me by what scientists call "private communication."

What happened was that a friend of mine, some years ago, was asked to participate with other housewives (this was *ten* years ago) in a tasting test whereby General Foods would, through such surveys, determine what little goody with which to tempt the American public of one age or another. After the test, the affable surveyor gave a charming lecture about food and taste and mentioned the fact that blue, they had found, was a lousy color for food. Even New Guinea children would turn down a pure blue chocolate chip cookie. (To what lengths the market researcher must go!)

Why no blue food? Blueberries are really purple. Bleu cheese has always looked greenish to me. Blue is a nice color, for bedrooms and skies. Why not for food? Think about it.

Maybe we should put General Foods to work on selling green polar bears. . . .

More trouble

There's practically nothing anymore that's good for you. Coffee, tea, cocoa and colas, long the mainstay of what we like to think of as a civilized way of getting through the morning and afternoon, have recently been suspect in the nefarious and thoroughly depressing business of causing fibrocystic disease in the female breast, a situation where the cells go bananas in a benign way and make what doctors call, with their usual precision, "lumpy breasts."

According to *Medical World News* (Vol. 20, No. 6), a doctor has found that ceasing the use of these lovely drinks led to the disappearance of lumps which, albeit benign, are perhaps nervous-making. (Needless to say, neither the doctor, *Medical World News* nor this column advocates

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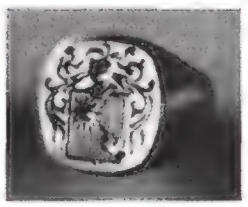

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ignoring a lump on the grounds that it's only the coffee.) Lumpy breasts may also increase the likelihood of being sort of subject in a statistical way to cancer, to paraphrase the cautious usage of the medical profession, which is by no means certain about what it has found here.

This, of course, will be bad news to our friends in Latin America who grow coffee and to our friends all over who grow tea. It seems that tea growers in Kenya are in special trouble these days. On Kenya tea plantations it hails 132 days a year, which is bad for tea plantations. And, it turns out, it's their own fault. According to *New Scientist* (Vol. 82, No. 1147), some scientists have found that tea harvesters kick up tea-leaf detritus into the atmosphere which, given local weather conditions, serves to condense water into hail. Indeed, tea-leaf litter seems to be a more efficient cloud-seeding agent than the silver iodide of the rainmakers, which suggests perhaps an alternate market for the tea (though not the coffee) that women should now, along with almost everything else, eschew.

Media meets science

It's not every week that a scientific journal—even a scientific trade journal—takes valuable space away from its news of trade nonsecrets and the reportage of important experimental discoveries to review a movie. But that is precisely what *Chemical & Engineering News* (Vol. 57, No. 14) did. The movie in question was, of course, *The China Syndrome*. The review appeared about a week BTMI (Before Three Mile Island), and I bring this up not to be the sort of I-told-you-so we've been hearing from. Steadfast readers of this column will recall that a number of questions about nuclear power have been raised gently here. But, being lay, these pages have no opinion, just questions.

It was with special interest that I inspected the *C&EN* report on a movie (*film*, my children insist) I was yet to see.

"Have the moviemakers seriously distorted the facts about nuclear power? Some experts in the nuclear industry say they have. So when," asks *C&EN*, "does artistic license become slander?" They go on to quote an industry spokesman as saying that the uncovering of the top of the core (by human error) was nowhere near adequate to cause a meltdown. Which, of course, in the movie it didn't. Nor did it,

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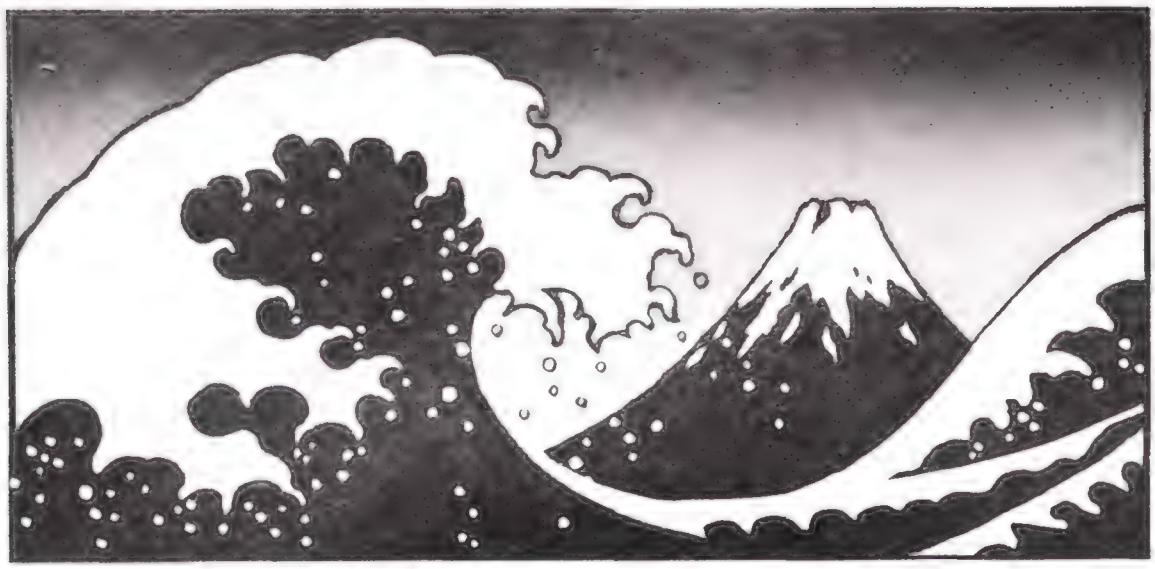

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in the movie, cause a large hydrogen bubble that scared the hell out of the Nuclear Regulatory Commission. But art can never mirror reality perfectly. Events, these days, tend to overtake even the satirist.

Events got pretty hairy in those April days long ago; it was so long ago that my cherry trees hadn't even blossomed yet. A friend called—a local environmentalist with considerable federal government connections—to warn us of the danger. She was calling from Dallas, where the next plane had been headed. Other dire calls ensued but, with that kind of sheeplike disbelief in catastrophes that are not already upon one, we didn't even pack our bags.

A couple of nights into the problem, while lines of people were snaking around the block where *The China Syndrome* was playing, an unexpected group turned up at our house for reasons unfathomable. There appeared an energy official from a large Western state, a high official of the NRC, and a man who had been in charge of safety planning for a major nuclear reactor manufacturer until he'd quit to become a consultant. And one of his clients, believe it or not, had been the producer of *The China Syndrome*.

Nobody felt especially comfortable that night, but he—the consultant—couldn't help smiling every now and then. And oddly enough, amidst the arm-waving and technical terms, even the most rabidly antinuclear person came out, that ominous night, with the same message as his opposition: go slow. Do not overreact (no pun meant there) and kill the nuclear industry. Take this incident, which ultimately worked out OK, but could easily not have, as an occasion to think and plan together.

Let us have no more games played about perfect safety and engineering wizardry. That emperor looks as naked as a jaybird. Let us have no more foolishness about shutting down all reactors until the protestors can keep my refrigerator running by some other means. Let us all grow up and think about the unthinkable, rationally and carefully, together. Let the industry and the government share the facts with us unwashed, ignorant, selfish, educable, ultimately wise citizens and we can probably help out.

In fact, we will decide. That's what we've been doing in this country, after all, for years with pretty creditable success.

—James K. Page Jr.

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Microcosm of a continental force: tribalism in Kenya

How do you describe another man's fear? Makula, the Kamba, didn't shout or shake or jump to his feet and run away. He simply jerked his head toward Kipelian, the Masai boy, and asked in tones of almost feminine timidity, "Masai? He's really Masai?" Makula's son Joshua nodded. The old man twisted his hands, his eyes flickered to and fro; the physical response was muted but his manner had changed completely. He was no longer a man politely entertaining his son's guest: suddenly, he had become a householder with a mortal enemy in the compound.

Masai *moran* (warriors) in Kenya had not raided the Kamba homelands en masse, killing people and stealing cattle, since 1968. But for many generations such events were an integral part of the rituals by which Masai boys became men. And as far as the Kamba were concerned, any Masai who crossed the traditional boundary at the Mwooni River was best greeted with a poisoned arrow, and a solitary Masai discovered in the village was clearly a spy to be put out of the way without delay.

Such were the truths that Makula had known from childhood, and yet he was in his own compound with a Masai seated beside him. His own son had brought home to him—literally, in the shape of a Masai school friend—one of the deeper implications of education in modern Kenya: tribal distinctions are supposed to be part of the past; at school you learn to be Kenyans.

Makula does not know his age exactly; he believes he was about four years old at the time of World War I. He never attended school, does not speak English and barely understands "up-country" Swahili, the more

(Continued on page 42)

Samburu *moran* (warriors) of bride's clan gather to await feasting and dancing at wedding ceremony.

A common phenomenon throughout black Africa

Territories of Rendille, Kamba, Samburu, Luo, Kikuyu, Turkana and Masai preceded political divisions and may outlast them

In black Africa, with whites controlling, basically, only South Africa, a great potential threat to political stability and a peaceful existence is the power of tribalism. There are staggering economic problems, of course, but in the last two decades violent conflicts between tribes have erupted in Zaïre, Nigeria, Burundi and Rwanda, Angola, Ethiopia, Sudan.

There are widely expressed beliefs that in Rhodesia, even as power passes to the black majority, there will be tribal strife later. The two commanders of Patriotic Front forces, Robert Mugabe, of the majority Shona, and Joshua Nkomo of the Ndebele, operate from Mozambique and Zambia respectively.

Tribalism has existed in some form in all societies. It is the community of language, culture, customs, territory and religions which holds groups of people together. A non-African example of tribalism is found in the unhappy Kurds, who are spread over parts of Turkey, Iran, Iraq, Syria and the USSR.

In African tribal society, the old and widowed are cared for, children are clothed, the needy are fed. This ancient order preserves tradition and with a strong sense of community and collective responsibility tries to fulfill the needs of all.

When Africa was arbitrarily divided among the European powers in the late 19th century, tribal territories were not considered. Tribes were divided, while hostile groups were thrown together under single colonial administrations. In some places the colonial governments tried to govern through tribal systems, but in reality tribal concerns got little attention. Later on, African politicians exploited tribal loyalties to fuel anticolonial movements.

Today, no one knows how many tribes there are—the estimates vary from 1,000 to 1,500 depending somewhat on how one defines a tribe. They fit into two-score countries—this is the State Department count, which excludes the northern Mediterranean, largely Arab, nations. One tribe may find itself partitioned among two or more countries. The Lunda, for instance, live in Zaïre, Angola and Zambia.

The violence which can result from rivalries is illustrated by the Biafran war with the Ibos in Nigeria (1966-70), although estimates of half a million Ibo deaths from military action and starvation are probably exaggerated. Nigeria's more recent history indicates national unity can work for general betterment.

Kenya, another special case, is examined in the article starting on the opposite page.—The Editors

Joshua (left) and his family, in Kamba country compound, rest before threshing crop of cowpeas.

fundamental *lingua franca* of Kenya's rural people. His father was a prosperous man who took four wives, had a large herd of cattle and grew crops.

Like all of his age group in Kenya (and farther afield), Makula has watched apprehensively while people have multiplied and the available land has diminished accordingly. The crunch came for him in 1971, when the Kamba homelands were surveyed and their ownership adjudicated. Along with everyone else, Makula had to give up all his traditional general rights of land usage in exchange for the title deeds to eight acres. Just enough, he says, to grow some grain and some cowpeas, and graze three cows. Amazingly, he has managed to support himself, his wife, his mother and eight children on these eight acres.

It is a minor miracle that Makula's eight acres feed the family *and* send Joshua to secondary school at perhaps the price of a cow a year (only primary education is free in Kenya). Joshua will learn English; he may count the dreaded Masai among his friends; possibly he will find a good job in the city, think of himself as a Kenyan and help support the family, but his three brothers and four sisters may not get the chance.

Joshua and Kipelian attend the secondary school at Emali. Recently, the school's Debating Society had before it the motion that schools in Kenya should be tribal. Under a tin roof, crowded on rough wooden benches, following the style of British parliamentary procedure ("Mr. Speaker, Sir, may I respectfully suggest that the honourable member is talking through his hat . . . ."), the motion was resoundingly defeated. The summation: "Kenya is a democracy, schools are not for tribes, they are for the nation. Our children must mix as in a true democracy."

But, mixing with the children after a debate, a visitor might have wondered about the depth of conviction. The formal English soon faded, to be replaced by Swahili and, as the crowd broke into smaller groups, by the assertive tones of tribal languages.

Immediately after the debate, Kipelian drew his cousin Dokolo to one side. We had arranged to visit Dokolo's *manyatta* in Masailand. Joshua wanted to accompany us, just as Kipelian had gone with us to the Kamba village. But such social reciprocity was impos-

Though Masai cousins Dokolo (left) and Kipelian mix easily with Kamba Joshua (center) after debate

The author's most recent article in SMITHSONIAN *was about Grévy's zebras. His personal observations are those of a resident journalist and a writer on ecology.*

sible, it seemed. The Masai boys were too embarrassed to tell Joshua to his face and asked me to pass on the message that "it would be too hard, it is better he doesn't come." Joshua was disappointed because he had never been to Masailand; still, he understood.

Dokolo's father, Medoti, is a prosperous man with six wives, four sons, many daughters and several large herds of cattle that are free to roam Masailand wherever he chooses. Though land adjudication and title deeds will come to Masailand, too, you could say that for the moment the Kamba and the Masai are "out of sync" by a generation or two. In terms of available land and wealth, Dokolo's father today stands where Joshua's grandfather stood 50 years ago. There is a good ecological reason for this. The rangelands the Masai occupy are drier than the higher lands where

Dokolo (left) helps his father Medoti, a prosperous Masai with six wives, four sons and many daughters.

on tribalism at their Emali school, they still cannot feel free to invite him to visit Masailand.

other tribes—the Kamba and the Kikuyu among them —first settled and began their cultivation of crops.

The Masai cattle have been cut back frequently by drought and disease; as a result, the number of people and animals in Masailand has generally remained below the maximum that the environment can carry. On the arable lands of the Kamba and the Kikuyu, however, the advent of improvements in farming techniques and corn culture have allowed the farmers to increase productivity rapidly and to support more people. So the farmers arrived first at the environment's holding capacity. Makula's family must either severely restrict its numbers or look beyond the tribal homeland for its living.

Across the railway line connecting Nairobi with the coast—in Masailand—this problem, though darkening the horizon, has not yet begun to bother the Masai seriously. If anything, the breakup of social structure that they see among the agricultural Kamba simply reinforces Masai conviction that their pastoralist lifestyle is superior. They see education as a nuisance; school not only takes a child away from family responsibilities, but also teaches him nothing about cattle.

So why, you may ask, did Medoti send Dokolo to school? The truth is that, bending before government pressure to educate his children, Medoti compromised by sending his youngest son to school. He could afford the fees for all his children, but the older sons and his daughters had more important things to do and learn at home. And as for their learning to be Kenyans, well, for a Masai it is enough to be a Masai.

Nomadic pastoralism as practiced by the Masai is a

These sails on the desert are actually sticks
and animal skins to be used for Rendille huts.

hard existence. The ability to keep cows alive and productive on marginal grasslands among lions and other predators produces a supreme self-assurance. The Masai believe there is no one better than themselves. Survival depends entirely upon the cow, so it is perhaps not surprising that the Masai believe every cow in the world belongs to them. This conveniently disposes of any moral problems involved with restocking. If drought, disease or predators should ravage the herd, you simply go and collect some from the folk settled on the hills—like the Kamba, for instance.

Immediately following their circumcision during the years before World War II, Medoti and his age group took to the forests on the slopes of Kilimanjaro. They were men now, *moran,* warriors of the tribe. There were hundreds of them, says Medoti, camped out in groups of eight or ten, eating the bulls their fathers supplied, constantly testing their own strength and bravery; they killed buffalo and made shields from the hides; they killed lions and made headdresses from the manes. By the end of the year, says Medoti, they were all so highly strung and fierce that a questioning look was enough to start a fight. All this strength and tension was ultimately to be unleashed in a raid upon the Kamba farmers.

It took place shortly after the long rains. Many Masai and Kamba were killed, he says, but altogether the raiders took several thousand head of cattle back to Masailand. Medoti's share of the spoils was 30 head.

Cattle raids across the pastoral-agricultural boundaries in Kenya still do occur, but they are small affairs. The law, of course, frowns more severely upon cattle rustling these days—but, apart from that, in strictly biological terms it simply isn't necessary anymore. Improved husbandry, cattle dips and veterinary services ensure that fewer animals die nowadays, and a man usually has an excess of stock to give his sons.

But the Masai, too, face a troubled future. Herds and population may continue to increase for a time, but ultimately the Masai will either have to restrict their numbers or look beyond the tribal boundaries for a living—just as the Kamba must today.

So we begin to see that no matter how much Makula may fear the Masai and Medoti scorn the Kamba, they actually have some very fundamental problems in common. Why, then, are the differences afforded more significance than the similarities? Worried politicians might answer: tribalism. Ecologists, however, have a more scientific explanation: niche separation. And here a bit of evolutionary theory seems called for.

Now a national reserve, the Karisia Hills once provided grass for Samburu cattle of the dry plateau.

All living organisms (be they birds, grasses, fish, fleas or Man) have evolved their own particular way of making a living—they have found a niche in the environment for themselves. Grass and trees are different forms of vegetation: cows eat grass, giraffes nibble off the trees; rodents feed on grass seeds, kestrels catch rodents during the day, owls go after them at night. In this fashion the environment has been divided in terms of both space and time—into distinct ecological niches.

Now Man is an animal, too, no less subject to the laws of ecology. We are primates like the apes. Once upon a time, some ten million years ago, our common ancestors shared a niche. When it became overcrowded and food scarce, the branch which was to become Man presumably stood up (which broadened the horizon in all directions) and moved to develop other talents. The brain expanded, we began to perceive cause and effect and to plan the future as well as remember the past—in the relatively brief span of five million years or so the whole world became our niche.

This is a drastic oversimplification of the evolution of Man, but the point is that it was fast, and driven by an instinct that we share with all other life forms and have never lost—namely, the primordial urge to split off and seek a new niche whenever anything threatens to restrict the food supply.

Every organism, throughout evolutionary time, has had to come to terms with the fact that its food source is not only the prime mover, but available only in a finite quantity. Perhaps this fundamental awareness is so deeply rooted in our instinctive being that the conscious mind overlooks it, and lays emphasis on the rituals of behavior and culture, "forgetting" that these exist only as exterior manifestations of the drive to maintain ecological separation and thus to preserve the food supply.

Given that ecological separation is so important, then it is hardly surprising that the tribal attitudes of both Makula and Medoti are primarily aimed at reinforcing their differences. Makula is an agricultural Kamba, and Medoti a pastoral Masai.

Early human societies consisted of hunter-gatherers. From this way of life came the two major niches into which men first divided their share of the Earth's land

resources: the pastoral life versus the agricultural.

Cattle can live wherever crops will grow, but the reverse is not true. Many see this as a root of human conflict, for to plant crops a farmer must establish proprietary rights over land that was formerly available to everyone. This is easier if the farmer is supported by a number of fellow thinkers; at first these would be the members of his family, which would grow into a clan and then a tribe. The exigencies of life would demand some uniformity of behavior, which would feed back into the life-style and reinforce the behavior patterns that most positively aid the obtaining and holding of the food source.

The dividing factor between the agriculturalists and the pastoralists is inevitably that of topography and—more fundamentally—amount of rainfall. The sporadic rainfall in areas unsuitable for crops inspired nomadism, and the very tenuousness of this way of life inspired the development of warrior classes to protect the food source and, if need be, to gather elsewhere.

Some figures to demonstrate the relative support capabilities of the two life-styles: of Kenya's land area of 569,000 square kilometers (220,000 square miles), only 15 percent is arable and 95 percent of the country's 14 million people live there, which works out to 155.8 people per square kilometer. In the pastoral areas, comprising about 421,000 square kilometers (163,000 square miles), there are 700,000 people, 1.7 to the square kilometer. Crowded as they are onto a restricted area, the agriculturalists have split into about 30 tribal groupings, while among the pastoralists—spread thinly across a much greater area with less cause for spatial conflict—there are just nine groups. The common boundaries among three of them—the Turkana, Samburu and Rendille, who live in northwestern Kenya—serve well to demonstrate the secondary separation of niches.

Samburu child herds sheep and goats as they graze on the high areas of Mount Nyiru,

which rises 8,000 feet and remains green during the height of the dry season.

Samburu woman with child walks near Turkana elders in village where tribal lands merge.

The basic distinction, once again, is that of food supply. All three tribes derive their sustenance from animal protein—milk and meat—but they keep different stock. I once asked a Rendille why there are people called Rendille and others called Samburu. To him the answer was obvious: if a man has camels he must be Rendille, if basically cattle he is Samburu. And the Turkana? They live—some would say exist—in the driest and most severe lands of all, in the Rift Valley around the southern end of Lake Turkana (formerly Rudolf) and along its western shore. They mostly herd goats, but are also seen with both camels and cattle. The Turkana are capable of staying alive under what must be some of the most rigorous conditions on Earth. Their opportunistic life-style calls for little in the way of cultural restrictions—they do not circumcise, and food taboos would certainly be counterproductive. This in itself is an important distinction, as I realized once when a Samburu told me with disgust that "the Turkana will even eat fish!"

The Samburu, Rendille and Turkana territories meet—merge is a better word—along the Ndoto Mountains south of Lake Turkana and down the edge of the Rift Valley to the southwest of Mount Nyiru.

For the Samburu, Nyiru is a holy mountain. God,

as they understand the concept in a purely spiritual sense, resides in a cave on one of the peaks. Surrounded by semidesert, Nyiru is a steep ridge of mountain soaring to more than 8,000 feet. It is cloaked with deep green cedar and podocarpus forest. Burbling brooks lace the lush meadows in the clearings on the top, where, when I was there, herds of Samburu cattle grazed. I climbed the mountain with Linolosi, an elder from Maralal; our guide was a young man named, appropriately, Nyiru.

Mount Nyiru is a paradise and the Samburu have ritualized the part it plays in their lives—they like to wear sprigs of cedar in their hair, and after a meat feast their *moran* will fasten the skulls of the animals they have consumed to a tree, facing Nyiru. The cultural pattern acknowledges the importance of Nyiru as a resource—a place where they can find grass for their cattle when everywhere else is dry and withered.

I remember asking Linolosi why some Samburu didn't stay there all year round—it is such a beautiful and productive place. A silly question, which he answered politely, explaining that a sustained rich diet sickens the Samburu's dry-country cattle; also ticks and disease multiply in the wetter climate and, of course, a dry season reserve constantly used provides less when it really is needed in severe drought.

Jomo Kenyetta, a Kikuyu, was Kenya's first president. He worked to interweave tribalism and nationalism.

Some of the tribal areas of Kenya are indicated on this map. The Luo, the Kikuyu and the Kamba are agricultural; the other tribes are pastoral.

The year I visited Nyiru with Linolosi was the third consecutive year in which the rains had failed. The whole of northern Kenya was bleached, and consequently the Samburu found themselves confronted with an infrequent but inevitable problem: as they moved their stock to the grass on Nyiru and other high ground, so the Rendille and Turkana moved into the land they had vacated, there still being browse enough for camels and goats.

I began to appreciate the step-gradations into which rainfall parameters divide Kenya's rangelands. The Samburu felt threatened, but the Rendille and the Turkana were driven by desperation and had no choice, and would have fought to keep their only food source alive on the meager vegetation that the Samburu cattle had left behind.

Feelings ran particularly high around the dams, the only water sources available. Tales filtered through to us of bloody skirmishes with Rendille around Isiolo, and Turkana encampments were apparently springing up throughout the Samburu district. The Samburu *moran* became increasingly anxious to take their spears and repel the invaders.

At the time we were camped southeast of Nyiru,

Luo leader Oginga Odinga led a significant but unsuccessful revolt against Kenyatta's government.

where a large dam still held water. Each day the herds gathered around the water, coming from miles across the plains, raising great clouds of dust. It was a tense, hot and uncomfortable time in which our part was to supply constant rounds of tea for the various groups of elders as they came and met and talked and calmed the excited *moran*. There were no clashes while we were there, but the visit was a sobering experience.

There is an even greater potential for strife among the settled, agricultural tribes such as the Luo and the Kikuyu, the latter being the tribe of Kenya's first president, Jomo Kenyatta.

"What will happen when Kenyetta dies?" I once put the question to a Kikuyu couple whom we shall call Diana and Simon. Both are well educated; he runs a wholesale agency, she teaches school. "The Luo will come and cut our throats," Diana said. "We have been too greedy, we have too much. The Luo want a share, too, and they will kill us to get it."

Undoubtedly the Kikuyu have done well out of their country's development since independence, and some jealousy was inevitable, but I was shocked to hear Diana express such a terrible fear. Tribalism! Could it really come to that? She and her kind have made the most of every advantage—the first of which was education. Isn't there some hope that her privileged class will learn to share their advantages before the desperate force them to?

The settled farmers took to education in Kenya long before pastoralists like the Masai and the Samburu even acknowledged that such a place as "Kenya" actually existed. Accordingly, educated farmers were the first Kenyans to move into government and administration. And they took their tribal affiliations with them—indeed, the first political movements among Africans in Kenya were tribal alliances. The Kikuyu were dominant from the beginning. Not only were they the most numerous tribe, they were also the first to experience intensive interaction with the European colonizers, and they were not slow to see the advantage of aiding, abetting and infiltrating the colonial regime. Ultimately they took it over. With Jomo Kenyatta at its head, the Kenya African National Union (KANU) eventually became the country's most powerful political party.

What happened after Kenyatta's death?

Kenyatta died in 1978, and could not have chosen a better time. Kenya had enjoyed two years of exceptionally good rainfall, and that happy circumstance is continuing. Coffee and tea have brought unprecedented prices to small Kikuyu farmers; a new cane-crushing plant has created hundreds of new wage earners among the Luo. Medoti's herds have recovered from the drought, Makula has an excess of cowpeas to sell. The Rendille camels have not needed to venture south of the Koroli desert; Turkana stock are reproducing and the Samburu *moran* strut like peacocks down Maralal's main street, ochred, sleek and fit, with their spears still sharp—but much more ornaments than weapons.

All this means that, at the moment, no one has much to gain by rocking the boat. Kenyatta's successor, Daniel arap Moi, the former vice president, became the only declared candidate for interim president and was certified by the nation's highest court to serve until the regularly scheduled national elections later this year. Although he is an extremely strong candidate for the presidency, it is possible that he may not emerge the winner. The major party candidate will be chosen by a party primary, and a new group or "tribe" that has recently appeared in Kenya will have considerable influence on the election.

The man in the street calls this group the WaBenzi, because the most he sees of them are their Mercedes as they drive past. They could just as well be called the WaVolvo, or the WaPeugeot (the prefix "Wa" denotes "the people of"), but no matter the car they drive, the

WaBenzi all have in common a degree of success in commerce, government or education. Though there are enough Kikuyu among them to satisfy the cynic, the WaBenzi comprise many tribes. But the new culture, education and success, is a common denominator that encourages them to ignore the old affiliations. When it came time to choose a successor to Kenyatta, this politically influential group might have been powerful enough to interfere with the orderly succession, but they saw clearly that a peaceful presidential transition was essential. This would be assured best by maintaining the status quo—by promoting the vice president to president, without having to hold an in-

As the grass becomes scarce in their home area, Samburu men and boys move their

terim election that might open dangerous splits within the country.

The validity of such politicking will not be revealed until Kenya's wheel of fortune has turned again. Until, that is, the rains fail; or East Coast Fever decimates the herds; or coffee-berry disease gets out of hand. Then people will begin to worry about the security of their particular resource, with the danger that some will revert to the old traditional loyalties and see a problem at the tribal level as their culture has always taught, rather than at the biological level where it truly lies.

I did not realize when I began assembling this article how much I believe in education. For all its faults, it is the only procedure that can teach us how frequently we respond to deep instinctive impulses of which our conscious mind is unaware—tribalism is a particularly volatile example, and all human beings are subject to it.

The early tribal conflicts of Europe are lost in history, but in Africa human populations have frequently reached the point of conflict under the glare of modern Western publicity, which tends to emphasize the cultural differences and surely persuades many that tribalism exists only in Africa. But, to some degree, it is in all of us.

cattle herds toward the remote Maralal highlands where the rainfall is more plentiful.

By David R. Zimmerman

Probing mysteries of how birds can navigate the skies

Researchers discover that the sun and stars, barometric pressure, polarized light and low-frequency sound may all serve as beacons

Standing in a fire lookout tower 200 feet above a hilltop in rolling, wooded farm country in western New York, biologist Melvin Kreithen opens a window. He gently tosses a homing pigeon out into space.

The muscular gray-and-white bird opens its wings and is flying in an instant. It climbs, makes a few zigs to the left and zags to the right—normal course-setting behavior—and heads out toward home.

This pigeon's loft is 60 miles eastward, near Ithaca, New York, at Cornell University, where researcher Kreithen is exploring birds' navigational talents. He releases "racing homers," as these specially bred birds are called, from fire towers and other vantage points so he can watch them make their directional decisions. Under normal circumstances, the bird he has just released from the Jersey Hill fire tower could be home in Ithaca in about an hour.

Suddenly, however, just when it should be vanishing from view on a homeward course, the pigeon veers back and returns. It flies confusedly in circles over the tower. Its homing ability seems to have been blacked out—like a pilot's, when his instruments fail.

This is unusual behavior. When homers are released within several hundred miles of home, they unhesitatingly head out in roughly the right direction. More than 95 percent arrive home on schedule.

The author, who writes often about the natural sciences, reported on the attempts to save the whooping crane in October 1978 SMITHSONIAN.

There exist, however, what pigeon owners call "special sites," where the birds become disoriented. Jersey Hill is one of the most dramatically disorienting of these places. Pigeons released there go out, come back, linger, wander about. Only 40 percent *ever* find their way home; some straggle in months, even years, later.

"Something at Jersey Hill permanently blows out these birds," Kreithen explains. "Pigeons are sensitive to something that we do not know how to measure, something that tells them how to get home. Jersey Hill is one of the places that contains the secret!"

By finding out what it is, Kreithen and his boss and co-investigator, Cornell biologist William T. Keeton,

Research in bird navigation is reflected below. Migrating robin (right) needs internal clock and

hope to discover what cues the pigeons normally rely on to find their way home. This is one of the great unresolved mysteries of animal behavior. Conceivably, it is a key to the related—also unresolved—mystery of how birds plot their migratory journeys.

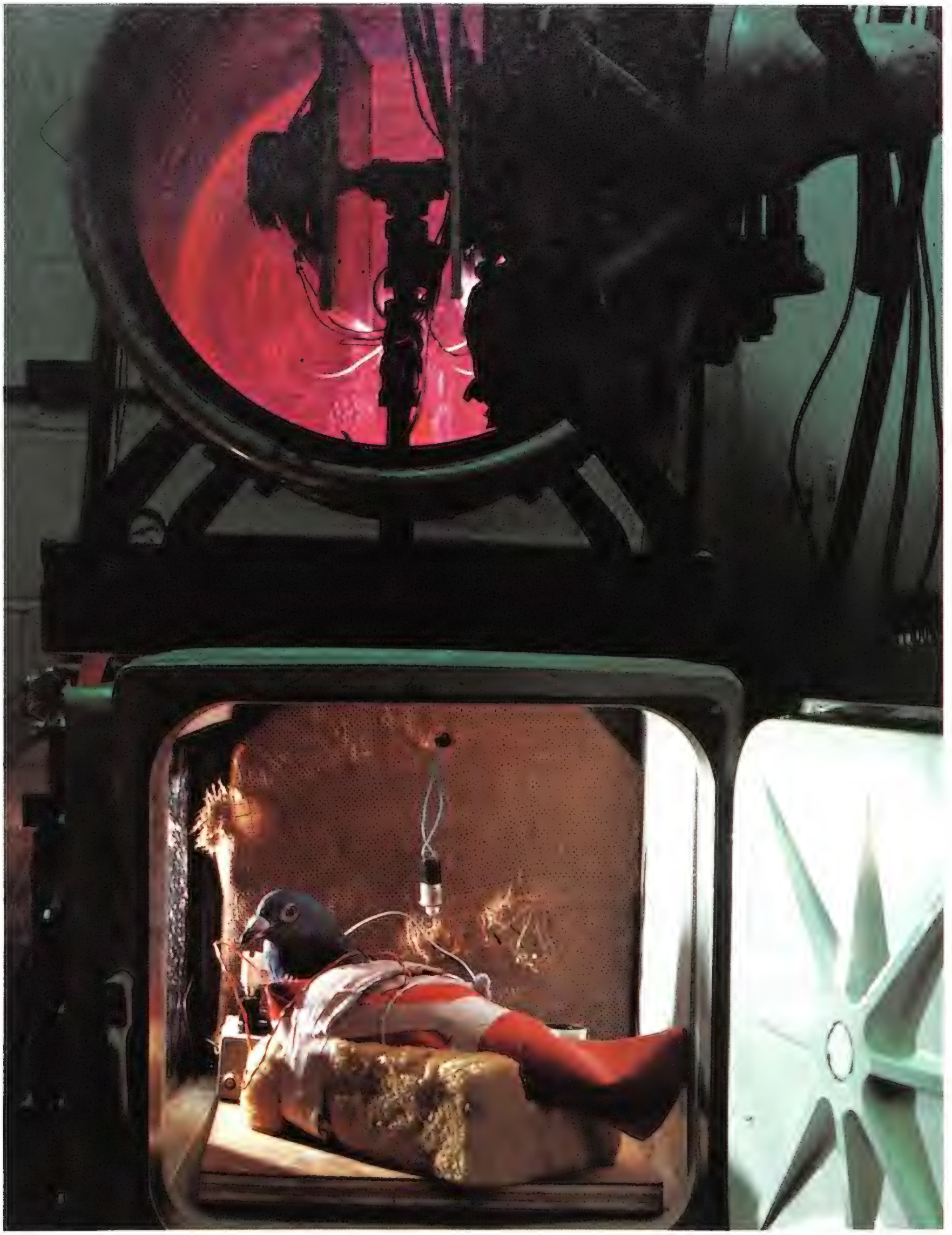
Bird navigation research—which pursues these twin mysteries—has progressed rapidly in recent years. This in large part is due to scientists' use of sophisticated new tools, including radiotelemetry and radar, to find, count, and even follow birds traveling through the sky.

The researchers already have identified several types of orientational cues that birds do use, and others they might use, to set and sustain a course of flight. What still wholly eludes scientists' understanding is how birds perform true point-to-point navigation—which appears to be what is required if a racing homer is to regain its loft from a distant release site or a songbird is to return from the tropics to the backyard rosebush in which it bred last year.

Birds' directional faculties fall into two broad categories, proposed a quarter-century ago by German ornithologist Gustav Kramer. One is a *compass component,* the other a *map component.*

The compass component, it is assumed, allows a bird to orient itself, so that it can set out and fly a straight-line course in a particular direction. In much the same

compass. Migrants released from balloon (center) rely on stars or sun. Infrasound waves (wavy blue band) are possible beacons. At left is "special site," like Jersey Hill near Cornell, where homing ability fails.



To learn if pigeons can hear low-frequency sound, Cornell scientists place them in box connected to sound generator (top). When generator goes into action, the pigeon's response shows up on its EKG.

way a Boy Scout who is lost in the woods with only a magnetic compass for guidance can select and maintain a course—whether north, east or south-southwest —until he runs into a road or other landmark. What he cannot do with just his compass is set a course from where he is—lost—to his distant home.

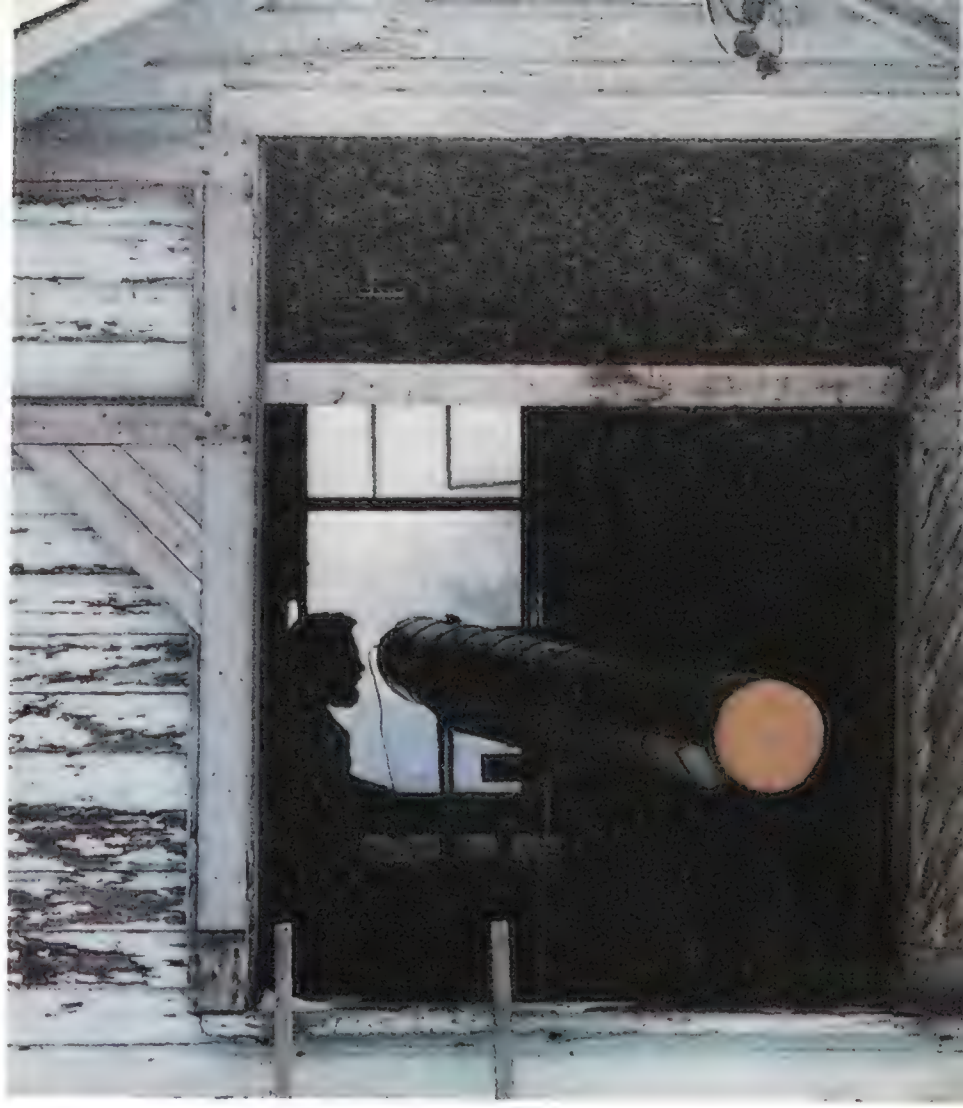
To find home, Scout and bird both need a map, a representation of the Earth's surface with which to relate one's present location to one's destination, in order then to select the correct heading. Scouts carry maps in their packs. But it is hard to imagine where a bird carries its map—or what that map shows. Without it, however, a bird could not get to where it is going.

When Mel Kreithen carries a pigeon to Jersey Hill, all of its homing faculties are rendered ineffective. This prompts Kreithen to wonder if the mysterious force there is blotting out the bird's map component. If true, and if he could discover the site's secret, he would be close to identifying the pigeon's map.

The work of Keeton and Kreithen is part of a concerted effort at Cornell to unveil the secrets of bird navigation. From an adjacent lab, their colleague, zoologist Stephen T. Emlen, studies caged and free-flying migrating songbirds.

The white-throated sparrow—the pert bird that seems always to be whistling the name "Sam Peabody!" when one encounters it in springtime—has been Emlen's principal test subject in recent years. He tracks these tiny birds as they head north, using sophisticated radar equipment to analyze which navigational cues they use to set their course through the sky.

"What we're doing," he explains, "is tracking the decision-making of the bird as it sets itself on its migratory course." One method that he and his wife and coworker, Natalie J. Demong, developed for this purpose is to capture migrating sparrows in nets, and then to send them aloft in a cardboard box suspended from a helium-filled weather balloon.



Stovepipe "gun" helps produce low-frequency sound that calls specially trained pigeons back to the loft.

Ever-present coffee cup in hand, Mel Kreithen adjusts electronic apparatus he uses in homing research.

The release container, or "Natalie box"—which is named for Ms. Demong, who designed it—has a trapdoor bottom that is tied shut with fishing line. A fuse is attached that will reach and burn through the line, opening the trapdoor at a predetermined altitude.

During one observation period, balloons were released at the National Aeronautics and Space Administration (NASA) rocket-tracking station near Wallops Island, Virginia. In such an experiment, as the balloon rises, the NASA radar operators lock their instruments onto it. When the Natalie box springs open, and the bird is "dropped"—to use Emlen's word—the radar follows it, and the computer plots its position. The radar trackings show that the birds usually fly erratically for the first minute or so, as they make their decisions, then head out in a straight line.

The usual migratory course for wholly free, wild white-throated sparrows that pass over Wallops Island in spring is northeasterly. Captured and displaced white-throats dropped in mid-air, even on a night when the ground is obscured by fog, also set out to the northeast—provided the sky above is clear.

Mysteries of bird navigation

The sparrows seem to use the stars for orientation, Emlen says. This view—that nocturnal migrants steer by the stars—confirms an earlier, classical experiment that Emlen conducted a decade ago, using indigo buntings. These buntings set off on their migratory flight as night falls. If netted and held captive in migration season, they display a dramatic—desperate—behavioral trait called "migratory restlessness." They hop, jump and flutter up and down, sometimes a hundred thousand or more times in a night, trying to continue on their way, and orienting their hopping in the direction they normally would travel.

Emlen, when a graduate student, put restless migratory buntings inside circular cages in a planetarium. When he projected the star map of the sky on the ceiling, he could induce them to reorient themselves, and hop southwest rather than northeast, by projecting the northern stars onto the southern side of the ceiling. And he found that buntings—like Boy Scouts—use constellations in the northern sky, including the Big Dipper and Cassiopeia, to obtain compass headings.

The sparrows dropped from Natalie boxes, like the buntings indoors, thus seem to orient their flights on the basis of stellar cues. So Emlen changed his experiment to discover what they would do when there were no stars to guide them.

When sparrows are dropped before the stars are out, they head out correctly to the northeast, provided the sun or its afterglow remains visible. The sun's position at sunset thus seems to serve as a secondary orientational cue. But, when this reliable backup also is unavailable because the sky is wholly overcast, sky-dropped birds switch to still another—but less reliable—cue: they fly downwind. They will fly downwind even if the wind is blowing in the opposite direction from the way they ought to be going.

In an experiment in Germany, pigeon's sense of smell is tested by injecting odors into the glass bulb.

On the beam, even in the clouds

Puzzlingly, wholly free, wild migrants fly off Wallops Island in the correct migratory direction, even on overcast nights. Apparently the ability to see the sunset, and integrate its position with other information obtained on the ground, will allow the birds to leave on an appropriate course later on in the evening, even after the ceiling has fallen and visibility is nil.

These findings, together with complementary results from other laboratories, have changed researchers' approach to the migration puzzle. As Emlen's colleague Keeton explains: "The old hope that one simple system will be found to explain all of avian orientation seems no longer tenable. Birds utilize multiple cues, some of them redundant."

The survival value of overlapping guidance systems becomes understandable in light of the closest human analogue of bird navigation, instrument flying. Pilots use a wide range of radio, radar and magnetic systems and beacons. Too much is at stake for pilots or birds to rely wholly on any single, fallible set of cues.

Birds that migrate long distances over water have an ability to foretell the weather that scientists have not yet explained. Every autumn, tens of millions of birds fly southeastward to the Atlantic coast of the Maritime Provinces and New England, where they stop, feed, fatten—and wait. On only a very few evenings each year do large flights of these migrants—many of which are warblers that weigh less than an ounce each—take off for their fateful journey and head out to sea.

Their flights have been followed by biologists Timothy C. Williams and his wife Janet, who correl-

To learn importance of vision in homing, plastic lenses are placed over pigeons' eyes. This "control" pigeon, wearing clear lens, will reach home quickly. Birds with frosted lenses are slower, but get home, too.

ated radar sightings of these bird masses with data from National Oceanic and Atmospheric Administration weather satellites. They recorded moderate to heavy flight movements on 93 different occasions in six years. Only two of these flights appeared to be headed into the path of an oncoming storm, which suggests that the birds make go—no-go decisions, before leaving shore, based on what the weather will be like many hours later, far out to sea.

Most flights took place on nights when a cold front was moving down from the north, predicting fair weather ahead and providing a tail wind to hasten the migrants' journeys. This in itself can be a life-or-death factor, since songbirds, unlike pigeons, are weak, slow flyers—albeit persistent ones—whose air speed is only 20 to 30 miles per hour, sometimes less.

The flight path these birds select is southeast past Bermuda where, in mid-ocean, they meet tradewinds that blow toward the southwest, and carry them back toward landfall in the Antilles and South America. The Williams say this is the longest known nonstop flight for small birds: they travel almost 2,000 miles.

This means the migrants are ceaselessly airborne, without food or rest, for three and a half days or longer. Besides their awesome energetic feat—the equivalent, the Williams say, of a man running four-minute miles for 80 consecutive hours—this eastward-sweeping route seems to allow the birds to reach South America safely without using a map. The birds can simply stay on a constant heading, and rely on the winds to bring them out in the right place.

Pigeons are easier to study than migrants because they can be raised in quantity, and because homing experiments can be conducted through much of the year. The pigeons, finally, must use true navigation since they return home from strange release sites—a feat considered impossible with only a "compass."

Researcher Kreithen brings some unusual skills to his studies with them. He has a family background—and a tinkerer's knack—in electronics, and in engineering, for which he earned his undergraduate degree at the University of Maryland. He soon found engineering problems fascinated him far less than the mysteries of nature. So, despite one senior biologist's avowed doubt that an engineer could live with the imprecision inherent in natural science, Kreithen transferred his

Radar tracking has shown that prevailing winds play important role when small migrants fly to South America. The birds keep flying southeast, but the Caribbean tradewinds blow them southwest to land.

talents to bird study. This pursuit complements his personal interest in animals and the environment: he wears, on a neck chain, a small, metal sperm whale medallion which, he explains, expresses man's need to be in balance with the Earth. At 37, Kreithen retains a boyish appearance, offset by an underlying gauntness. He has a pleasant manner that barely conceals a taut, fervid—even hectic—intelligence, which he seems to repeatedly recharge by consuming container after container of strong black coffee.

The homing pigeons whose skills Kreithen is trying to unveil belong to selectively bred captive strains. Although pigeons are the most well-known homing animals, other species also have the homing trait. Only a few have been tested, Kreithen says, but these cases are dramatically convincing.

Bank swallows, for example, must eat daily or die. When the insects they feed on are scarce, they will fly hundreds of miles to find a meal—and may be gone many days. The chicks of many bird species would die in the interim. But baby bank swallows, through a sort of suspended animation, can survive up to two weeks unfed, awaiting their parents' return. Adult swallows trapped at the nest will return home from distant release sites during these two weeks. But if held longer, by which time their young would have died, they no longer will fly "home" when freed. In these swallows there thus is evidence that homing—and the map component—are natural endowments.

The sun is not the only cue

In the easier-to-study pigeons, the cue that brings them home long was thought to be the sun. The sun's position at noon reflects the point of the Earth's surface from which it is viewed. And so if pigeons could remember that position, as seen from the home loft, and could quickly calculate the noon position of the sun at a release site, they then could use these two reference points in the sky as visual navigational beacons to set a course for home.

A number of researchers since have shown—almost conclusively—that while pigeons do obtain compass headings from the sun, the navigational map that tells them which heading to choose is not based on solar positions. Thus the search for alternative cue systems has intensified. The half-dozen bird navigation laboratories in the United States and Europe have produced a vast and bewildering array of experimental evidence —some published, much not—which suggests that pigeons use a wide variety of cues. As a result, participants in this research, like outsiders, often are hard pressed to make sense of the data. Fortunately, there is an acknowledged standard. Kreithen explains, tongue in cheek: "You have to pass 'Griffin's test' before your work is accepted!"

The test is the knowledgeable judgment of biologist Donald R. Griffin, of the Rockefeller University in New York City, who is a pioneer in the study of animal navigation. Griffin's stature in the field, Kreithen says, justifies his cautious stance toward new findings. But Griffin himself says, with a laugh, that his legendary skepticism simply represents good scientific practice.

"Inconsistent results are *not* the sign of a problem that has been solved," he says. "In bird navigation, one should not believe anything until it has been replicated by two or three people in two or three places!"

By those standards, the only major conclusions that pass the test are the demonstration that birds use the

sun and stars for orientation, but use other—still unidentified—systems under cloudy skies.

One possible set of cues that impresses the Cornell researchers, but has *not* passed Griffin's test, Griffin adds, is magnetism. The idea that a pigeon, like a Boy Scout with his compass, can use the Earth's magnetic forces to set its course first was suggested a century ago. It lost popularity when experimenters were unable to show that attaching a magnet to a pigeon's head interfered with its homeward journey.

Then Keeton, at Cornell, showed that while magnet-bearing pigeons head straight home under clear skies, many do *not* do so when the sun is obscured by clouds. They eventually get home, but arrive later than "control" pigeons carrying an equal weight of non-magnetic brass. In Keeton's view, therefore, magnetism does play a role in bird navigation.

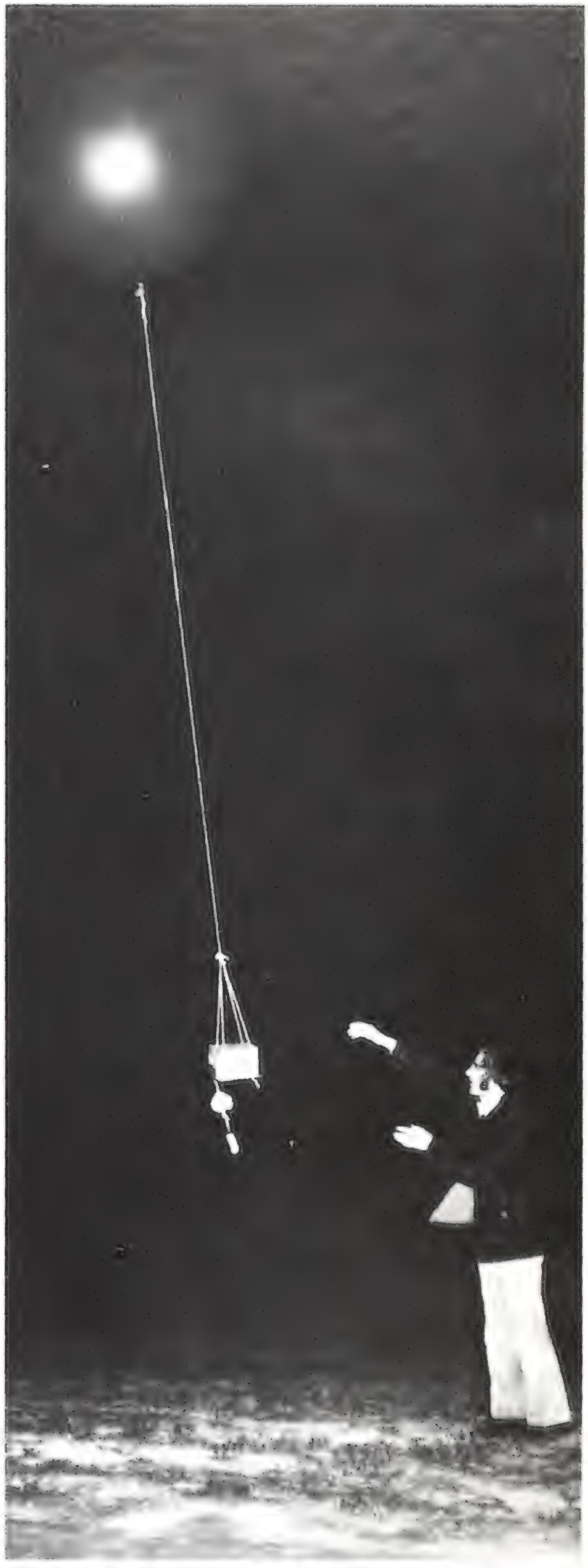
Confoundingly, magnets seem to have a paradoxical effect on pigeons released at Jersey Hill: the magnets do not help the pigeons get home—for the birds fail to arrive there. But carrying a magnet does prompt a pigeon to depart from the fire tower toward the north or the west, never toward the south or east. This suggests that magnetism is a part of the site's special nature. But there appear to be no geomagnetic aberrations at Jersey Hill—so the puzzle remains.

"They know everyplace on Earth!"

The possibility that pigeons use their demonstrably keen eyesight to find and to follow landmarks home has been discounted by experiments in which the pigeons wear frosted contact lenses. These lenses admit some light, which keeps the birds from landing and going to sleep, but cancel out all object vision. The pigeons return, usually to within a hundred yards or so of the loft. This indicates, Kreithen says, that they normally use sight only to get in the door so to speak, and rely wholly on nonvisual cues for the lion's share of the journey. "Incredible though it may seem," he adds, "this means that the birds know everyplace on the Earth with an accuracy of a hundred yards!"

A few years ago, researchers felt that neither topographical cues nor the birds' experiences during the outward journey from loft to release site could be convincingly shown to play a part in homing. The possibility that pigeons could remember each outbound *zig*, then make a compensatory mental *zag* in calculating how to get home, nevertheless was attractive because it would solve the map puzzle. Birds that could compensate perfectly for the twists and turns of the outward journey by this kind of dead reckoning wouldn't *need* a map to get home.

"Intriguing as this possibility is, all the evidence is against it," Keeton says. "Pigeons have been carried



Cornell's Steve Emlen sends bird up in "Natalie box." When balloon reaches right altitude, bird is released.

to release sites while riding on turntables or in rotating drums, yet this has no effect."

The outward journey thus was discountable, until an Italian researcher, Floriano Papi, and his colleagues at the University of Pisa showed recently that they sometimes could change the headings on which pigeons set out for home by taking them on long circuitous detours on the outbound journey. These responses occurred only when the pigeons could smell the changing odors of the countryside through which they were traveling. This strengthens the Italians' view that pigeons use olfactory cues.

The researchers in Pisa recently worked with Keeton and Kreithen, at Cornell, on pigeons' ability to smell their way home. In the end, the researchers agreed on *what* was done, but they disagreed—in two separate and contradictory conclusions—on what the results show and mean.

The realization that the known solar and stellar cues will not get a pigeon home has prompted an intense search for other cue systems the birds could be using. The first requirement in these experiments is to be able to ask the bird, in effect, "Can you sense the cue we are presenting to you?"

An electrode is passed into the bird's skin for this purpose. The bird also is attached, via a separate, surface electrode, to an EKG machine, which keeps track of its heartbeat.

A cue then is presented to the pigeon, followed a few seconds later by a very mild electric shock. This creates a classic conditioned response. Thereafter the bird's heart rate will jump in anticipation of a shock whenever it senses the cue.

This method allows Kreithen to determine both the types and the sensitivity to stimuli—potential navigational cues—that pigeons can sense. He has found them to be extraordinarily sensitive to a surprisingly wide variety of stimuli, one of which could represent markings on the elusive internal map. Pigeons, Kreithen says, can see and sense changes in polarized light from the sky, which is visible even when the sun is hidden by clouds. Since this light is directionally oriented like sunlight, it might be used by the birds. They also are far more sensitive to ultraviolet light than has been believed—like humans, they were thought not to see it.

Pigeons can detect minute changes in barometric pressure, on the order of .07 millimeters of mercury. This means, Kreithen says, that they perhaps can sense altitude changes, in flight, of as little as ten feet. This acute barometric sense must help them maintain a level, efficient course when flying in clouds. It also may be a clue to wild birds' keen ability to detect oncoming weather fronts while they are still far off.

The lab finding that Kreithen today finds most exciting is his confirmation that pigeons can sense extremely low sounds, called *infrasounds,* that are as real, albeit alien, to the unassisted human ear as molecular structures are to the unaided human eye. Pigeons, Kreithen finds, can hear and differentiate sounds down to .05 hertz—which is 12 octaves below middle C.

For animals that have the capability to hear them the Earth is rich in these sounds. They are generated by mountain ranges, jet streams, ocean waves, thunderstorms and a host of other physical features. Many topographic landmarks, for example mountain ranges, produce consistent, identifiable signatures in the infrasound range.

Infrasound waves travel hundreds, even thousands of miles without breaking up. They thus may serve as beacons that the birds can use—as pilots use radio signals—for navigational aids. In short, a pigeon's perceptions of infrasound sources, and their relative locations, just might be the long-sought map component that allows it to locate itself, wherever released, and set courses for the different and unique infrasound pattern at home.

The possibility tantalizes Mel Kreithen that infrasound, or perhaps some other, similarly elusive set of cues, provides pigeons with their all-weather compass, or even their navigational map. Conceivably, a still-undiscovered natural force is being revealed by the pigeons' aberrant behavior at Jersey Hill. If so, Mel Kreithen wants to find it.

"It's mind boggling that these damned one-pound animals have that knowledge, and I don't have it," he says. "But I want it and it drives me crazy!"

Over Nebraska, migrating mallards cross the face of the moon as they follow their beacons in the sky.

By Robert Wernick

Maeght foundation, where art is fine and the grass green

A leading French art dealer has constructed a perfect setting for the work of some of the world's masters of contemporary art

Discreetly grandiose, the "Fondation Marguerite et Aimé Maeght" sits perched among the pines on a foothill of the Maritime Alps near the medieval walled village of Saint-Paul-de-Vence, between the snow-capped peaks and the warm blue sea. Every day a long file of cars comes curling up the narrow road from the coast, bringing visitors to admire its superb display of modern art, half in-half out of the landscape.

A frequent question is "How do you pronounce the name?" The answer is unexpectedly simple: you pronounce it "Mahg."

Aimé Maeght was born in northern France, in Flanders, and did not have his first view of the Mediterranean until he was 12 years old. It was 1918, after four years of German occupation, and he was lying on a stretcher, almost dying of malnutrition. He was to live on this lush, warm coast for 25 years. After his sufferings in the north, this strip of coast has remained a vision of paradise for him.

One spot in particular appealed to him—a steep rugged bit of wilderness just below Saint-Paul-de-Vence, a few acres of pine and live oak rising out of the tangled underbrush known as the *maquis*. In time, Maeght was able to buy the land he had long coveted.

Soon bulldozers were moving in, water rights being acquired, brush being torn up, plants brought in.

Robert Wernick, who lives in Paris, wrote about Tel Aviv's Museum of the Diaspora in SMITHSONIAN, *June 1978, and about the Lalannes, February 1977.*

American sculptor Alexander Calder, a Maeght favorite, made these playfully cavorting

Maeght always liked to think in big terms. His house overlooking the property has grown over the years. The rooms are filled with masterpieces: Etruscan vases on the sideboard, a Giacometti chandelier in the living room. On the terrace overlooking the swimming pool, a couple of hundred guests can be served the dinners which Maeght orders from a three-star restaurant. An aviary houses hundreds of birds. There are orange trees, lemon trees, a vineyard which produces enough delicate red wine to serve guests all year long. Thirty-nine thousand plants were brought in to turn this parched hillside into an opulent garden. In dry summers (almost every one), while all the countryside turns brown, the sprinklers are continuously twirling and the Maeght gardens and lawns are always green.

But Maeght from the beginning had ambitions for something more than a luxurious private residence. He wanted a place where artists could meet, relax, work undisturbed if they chose. He built a guesthouse, a graphic arts shop completely equipped with presses,

"critters" of aluminum in 1974. They disport themselves for everyone's pleasure in small garden.

inks, paper, and so on, where artists could experiment at their ease. He built a ceramics workshop with a traditional wood-burning oven and a modern electric one.

Beyond all this, he wanted a showplace—not a museum in the traditional sense but a space, partly indoors and partly out, in which important works of art could be admired in a setting worthy of them.

He first began talking about the project in 1950, on a visit to Cambridge, Massachusetts, with master architect José Luis Sert of Harvard's Graduate School of Design. It was a project after Sert's own heart; it was the kind of thing he had often discussed and sketched out over café tabletops in Paris in the 1930s. He wanted to design a space for the display of art, in which the artists themselves could collaborate in the conception and the execution. The structure, or group of structures, would follow what Sert calls the "anonymous architecture of the Mediterranean peoples." It would rise as naturally and unobtrusively out of the landscape as any village of the region—Saint-Paul-de-Vence

Aimé Maeght, foreground, where he likes to be, on carefully landscaped grounds of his foundation, with the foundation director, Jean-Louis Prat.

Photographs by Pierre Boulat

Pool has no less than what you might expect here—an underwater mosaic by Georges Braque.

for example, a cluster of squarish houses with terraces, gardens, patios. Like a village, it could be expanded in any direction by adding new buildings.

The actual work on the site began in 1960, and the first phase of construction took four years. In accordance with Sert's ideas, the artists themselves were called in constantly for observation and advice. The foundation was inaugurated formally in July 1964, with a speech by André Malraux.

It is easy to understand Malraux's enthusiasm. The foundation is surpassingly elegant, drenched in air and light, thoroughly Mediterranean. The works of the artists are well placed, well lighted; they invite an unhurried walk that takes you indoors and out, up steps and down.

The entrance gate opens onto a large sculpture gar-

Considered and sensitive concern for displaying modern works of outstanding artists, in settings made to augment them, is evident here in an entire courtyard peopled by Alberto Giacometti's bronzes.

At entrance, one can see through the grill American painter Ellsworth Kelly's *Red yellow blue,* 1963.

den, where amid tall slender pines the works of a score of modern sculptors rise like so many man-made trees, in raw granite, polished bronze or wood, or twirling strips of metal.

A Calder mobile is by the entrance, a happy choice, for there are always children coming with their parents.

The buildings are of standard modern concrete, its bare whiteness livened by bricks baked in the traditional Provençal way over wood fires. They are easy to get into and out of, there are glass doors everywhere, there is as much to see outside as in. Beside the exhibition halls and the administrative offices, there is a chapel in memory of the Maeghts' young son Bernard, who died of leukemia—a chapel with a medieval Christ and a stained-glass window by Braque. There is a library well stocked with reference books and documents on modern art, a cafeteria, an auditorium where lectures or concerts can be given—where exponents of the avant-garde like John Cage or Merce Cunningham can come to demonstrate their latest experiments. There are ceramic murals and mosaics; one by Pierre Tal Coat, scrawls like a prehistoric graffito along a garden wall. All in all, it is a place of easy enchantment.

A setting for art which is art itself

Even dogs in this setting form a linear counterpoint against the tiled floor and flowing Miró on wall.

The exhibition halls are on different levels, owing to the slope on which they are built. But the roof is at the same height for all, and so they all have different proportions. The works in these rooms are constantly being changed out of the boundless reserves of the foundation. And two or three times a year there are major exhibitions covering some great name or some striking feature of contemporary art. A special show dedicated to Miró will open July 7. The 86-year-old artist will attend and his new stained-glass windows done for the foundation will be unveiled.

There is always the pleasure of the unexpected to be found here, as when you turn a corner and come across a quiet pool full of fish—blue mosaic fish by Braque—or a perpetual-motion fountain by Pol Bury (opposite, center), a jumble of stainless-steel cylinders which scoop up water, rise to the horizontal, lose their balance, spill out the water, following a complicated rhythm. There is also considerable drama, notably in the placing side by side of two of the most spectacular displays of the foundation, Giacomettis and Mirós.

Giacometti has a hall to himself, and a terrace just outside. Through both of them loom or stalk the familiar Giacometti figures: men, women, dogs, thin-limbed, hieratic. The sun shines bright and pleasant, it might be any village square of the warm south, and all these creatures remain locked in their monomaniac solitude, staring out at a world in which they have no part.

Turn the corner from the terrace, and the world changes explosively. Here is a space baptized "the Labyrinth," which was turned over to Miró to people as he pleased with the products of his imagination. Everywhere you turn there is a Miró winking or leering or grinning at you. There is a monster cavorting on a roof, another planted with outstretched legs like a puppy dog on the terrace floor. There is an egg-shaped marble called *Woman with her Hair Undone.* There is an *Arch of Triumph* which might be a prehistoric megalith sprouting horns. There is a ceramic egg, a ceramic goddess, ceramic waterspouts and gargoyles overlooking a pool. There is a giant bronze pitchfork, a bronze girl painted in all the brightest Miró colors.

The choice of all these particular artists who are represented in the Fondation Maeght is no accident. They are all artists represented by, and sold by, the Galerie Maeght on the rue de Téhéran in Paris, which for more than 30 years now has been a key presence in French and international cultural life. There are also Maeght galleries in Barcelona and Zurich, and an American office in New York City.

Maeght's career began with a lucky accident, purposefully exploited and followed till it led to his current eminence.

It was back in 1932. Maeght and his wife, Marguerite, owned and ran a small print shop in Cannes. He spent long, hard years studying the craft of lithography, and he specialized in turning out the gay, colorful posters which were in demand for shows at the casinos of the Riviera. One day a satisfied customer, Maurice Chevalier, sent around another customer—a shy, elderly man with a gray mustache who had a watercolor he wanted reproduced for use as a poster advertising a charity event. His name was Monsieur Bonnard. First name, Pierre. The Maeghts could not do enough for him. He in turn was delighted by the printing job.

He told the Maeghts he wanted to put up the original watercolor for sale at an auction at the charity event. "I know those auctions," said Maeght. "You won't get 2,000 francs for it; leave it with me and I will get more than that." He put it in his window alongside some posters of his own, and within 24 hours had sold it for 5,000 francs. A new dealer had appeared in the art world.

Over the next decade, Maeght gradually built up his business, enlarged his circle of acquaintances. Artists were thronging through the south of France in those days; many of them were doing decors and costumes for the Ballet Russe de Monte Carlo. Picasso was there often, Matisse, Dufy, Chagall—a whole company of great names. The Maeghts got to know them all, and Marguerite especially developed a talent for helping them with little daily problems.

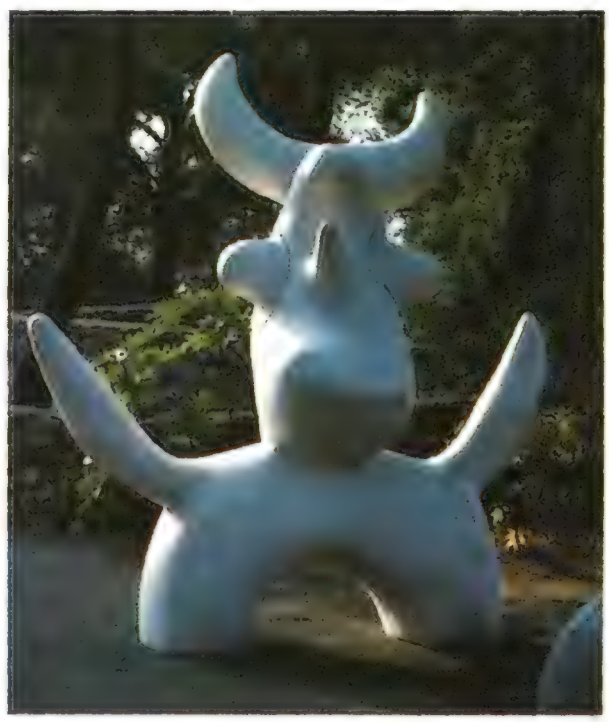
Relations grew especially warm with Bonnard and Matisse during the war years. Both painters lived near Vence and the Maeghts had a property there, including a cow whose milk helped them all survive the privations of the bad years. It was Matisse who urged Maeght to go to Paris as soon as the road was clear. When the Germans were out of the way in the summer of 1944, he got into a car with his elder son and with Bonnard and headed for the capital to make his name and fortune.

It was a considerable gamble. The art world of Paris was in a shambles after four years of isolation under German occupation. Many of the big dealers had had to flee for their lives when the Nazis came. Others who stayed open were being accused of collaboration with the Germans. No one knew what it would be like.

Maeght had no doubts and was prepared to think big. He was one of those who realized, more or less dimly, that the whole world of art was about to undergo an immense change. The artists he had met in the Thirties were well-known figures; their days of poverty and obscurity were long behind them. But their reputations were still limited; the man in the street would barely recognize their names. A new day was dawning in which they would become world figures, millionaires, superstars. GIs flooding through Europe had discovered at least two personalities to whom they were making massive pilgrimages. One was the Pope. The other was Picasso.

Maeght might have had Picasso, he says, when he opened his gallery in Paris and began to spread his wings, but that would have left little room for other commanding personalities. He preferred to sign up all the rest: Braque, Matisse, Chagall, Miró, Léger, Calder, Giacometti, the giants of the school of Paris, the revolutionaries who had blasted out new roads for the art of the 20th century.

He worked in a grandiose style befitting names like these. His gallery was princely. His receptions on opening nights were imperial: he would take over a major restaurant and invite two or three hundred people. He published handsome books about his artists, he offered them unlimited hospitality. His principle of business has always been to offer to buy artists' works outright instead of selling them on consignment. This ensures them an income and ensures *him* a plentiful supply of works of art.



Architect Sert called on artists for ideas about overall design and placement of art. From left, Miró lizard, Pol Bury fountain of stainless steel, Miró's *Lunar Bird*.

A setting for art which is art itself

For the first two decades after the war all the years were good. Maeght became immensely rich, and his vaults were stuffed with the works of masters. He realized he had a unique opportunity to create a monument in his lifetime, and the monument now stands sparkling on the hillside by Saint-Paul-de-Vence.

It is one of two such monuments that have been recently created in France—both enormously popular, providing an instructive contrast in contemporary taste. The other is the Pompidou Center—Beaubourg—in Paris (SMITHSONIAN, August 1977), for some a brilliant conception, for others an unholy mess.

The Fondation Maeght has its crowds, though they are counted in the thousands rather than the millions, unlike Beaubourg, which by last summer had clocked its ten millionth visitor. Everything at the foundation is uptown, first class. Even in the cafeteria, instead of the ordinary five-and-dime furniture, you sit on cast-iron chairs designed by Diego Giacometti, Alberto's brother (SMITHSONIAN, June 1975). The visitors following their serpentine way through hall and terrace, chapel and garden, treat it all with proper respect.

Will it last? Maeght himself is now 73, a vigorous erect widower, with the haughty well-pomaded look of the aging matinee idol. He is still very much in charge of his gallery, he still follows every detail of life at the foundation with his imperious perfectionist eye. He has not quite finished building there. Once he had a grandiose scheme for a 1,200-seat theater. But bureaucratic bickerings on the part of the local authorities—who were always a little suspicious of Maeght because he was promoting the works of foreigners, Parisians, and doing little for the village artisans who carved picturesque pepper mills out of olive branches—blocked the construction. He is happy today that they did; the big theater would have been a monster that would have devoured all the energies of the foundation, and he is thinking now of three small theaters for all kinds of work in any form—stage, film, dance, opera.

But there is a limit to the size of the foundation, and in general it has probably been reached. For one thing, it costs enormous amounts of money, and though Maeght's profits over the years have been huge, they are not limitless. The market has been slowly drying up, and his great names are leaving the scene one by one. The center of artistic gravity shifted noisily and decisively to New York during the 1950s. The great names on which he had built his fame and fortune belong to the past—or to the future. For the present, he has had to replace them with new ones—like Chillida, Rebeyrolle, Riopelle—familiar to collectors, but hardly as famous or as profitable as the older giants.

Those giants were once thought of as wild men—or even wild beasts, *fauves*—rampaging through the house of art and wrecking all its dainty furniture. Today they appear rather as the last representatives of the classic French traditions of order and harmony and good taste. The roar of the *fauves* today sounds like a shepherd's flute.

Maeght has provided an ideal home for their works. Sooner or later the property will revert to the French state, it will be run by the bureaucratic book instead of with loving zeal; banana peels may well pile up under the pines. But for the moment Aimé Maeght has every reason to be proud of what he sees when he looks down from his manor house at the visitors coming up the road from the coast. He has provided a fitting home and showcase for the things he loves.

Calder stabile, *Les Renforts,* at home near path leading to foundation, welcomes visitors.

A ceramic gargoyle waterspout, in area known as Miró's Labyrinth, is part of inspired landscape.

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That's where Western Electric's new process for plating gold is *conserving* the precious metal, through increased efficiency and precision. It's producing better switching components for the Bell System, to make your phone service clearer and more reliable than ever.

It must be gold that's plated to the switching components you see glittering in the photograph, because no other metal can provide the same kind of efficient, reliable, durable, and clear telephone transmission.

But until now, gold-plating had always been a messy and imprecise process. There had been no way to control it accurately. No way to avoid depositing excess gold on the places it was intended to go. And on the places it wasn't.

So Western Electric, working with Bell Labs, designed a totally new system to do the job. Combining the best of electro-chemical and programmed logic control technologies, the new system can plate gold with hair-thin precision. Depositing only the desired amount, only on the designated spot. With no waste whatsoever.

Gilt-edged savings

Besides producing a much better product, Western Electric has mined a savings of $9 million from the process. And that's another way we're helping your Bell Telephone Company hold down the cost of your phone service.

Even bigger benefits

And since the new process uses 55% less gold than the old one, we could more than double production of our improved switching component. Without consuming any more of the shiny natural resource.

But there are more environmental plusses. The new process has almost completely eliminated the gaseous wastes plating used to produce. It's cut the liquid wastes by 90%. And it runs on 67% less power.

This improved gold-plating technique is another way Western Electric is working to hold down the cost, while continually raising the quality of your phone service.

Keeping your communications system the best in the world.

Western Electric

The First Book of Moses called Genesis

Genesis

1:1 In the beginning
God created the heaven and the earth.
2 And the earth was without form, and void;
and darkness was upon the face of the deep.
And the Spirit of God
moved upon the face of the waters.

8 And God called the firmament Heaven.
And the evening and the morning
were the second day.

9 And God said,
Let the waters under the heaven

3 And God said,
Let there be light:
and there was light.
4 And God saw the light, that it was good:
and God divided the light from the darkness.
5 And God called the light Day,
and the darkness he called Night.
And the evening and the morning
were the first day.

6 And God said,
Let there be a firmament
in the midst of the waters,
and let it divide the waters from the waters.
7 And God made the firmament,
and divided the waters
which were under the firmament
from the waters
which were above the firmament:
and it was so.

be gathered together unto one place,
and let the dry land appear:
and it was so.
10 And God called the dry land Earth;
and the gathering together of the waters
called he Seas:
and God saw that it was good.
11 And God said,
Let the earth bring forth grass,
the herb yielding seed,
and the fruit tree yielding fruit after his kind,
whose seed is in itself, upon the earth:
and it was so.
12 And the earth brought forth grass,
and herb yielding seed after his kind,
and the tree yielding fruit,
whose seed was in itself, after his kind:
and God saw that it was good.

By Doris Grumbach

Reproduced here, with the type in its actual size, is the opening text page of the Washburn College Bible. The size of the page is 10 by 14 inches.

A handsome, poetic new design is wrought for the Great Book

After ten years of assiduous and complex labor, a new three-volume Bible, the work of Bradbury Thompson, is off the press

Article begins on the following page

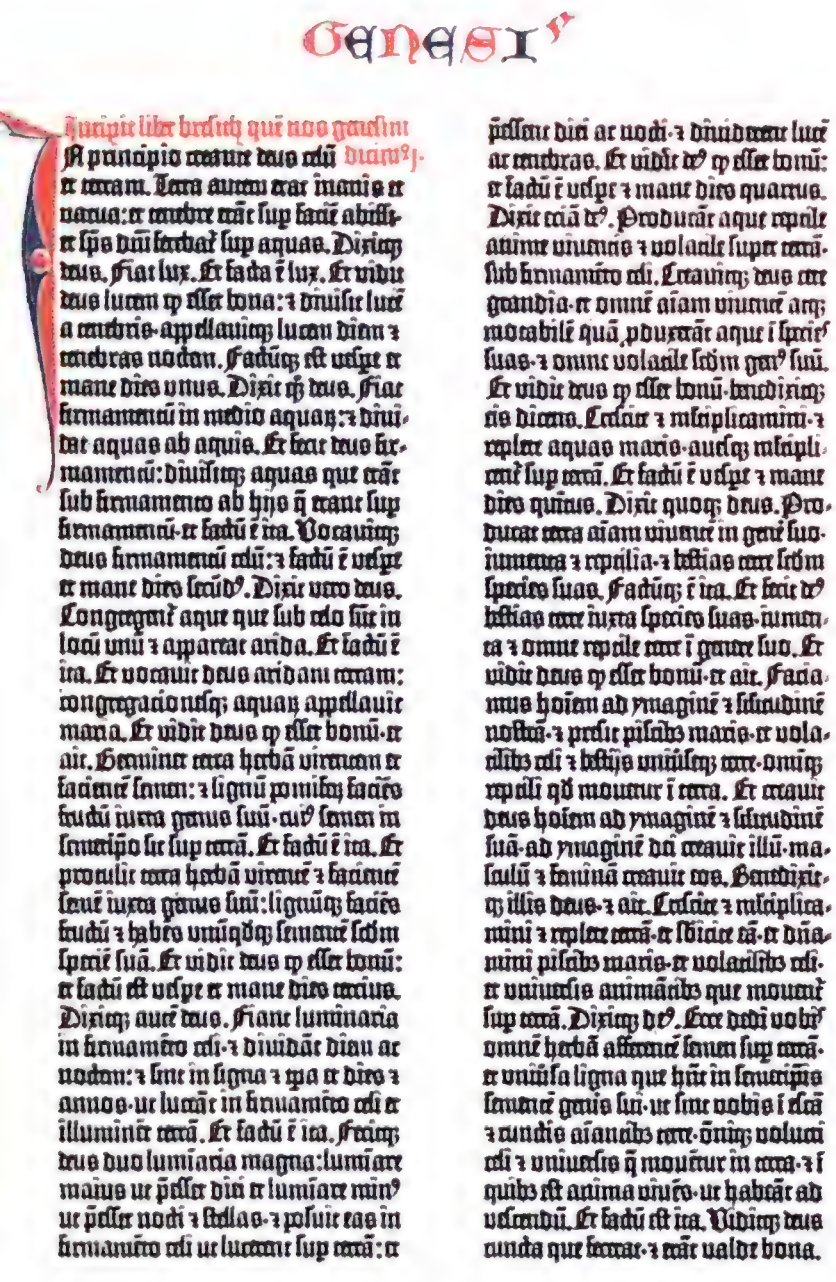
Ever since Johann Gutenberg designed the first Bible set with movable type some 500 years ago, there have been other designers who have sought to rival the master's feat. The challenge is great. Masters of design, aspiring to perfection like any artist, naturally have sought over the centuries to redesign the Great Book. If it were not for the formidable proportions of the enterprise, and the even more formidable costs of what is a very complicated and expensive piece of business, there might have been many more attempts.

So it was no small thing—but not that surprising, either—when some ten years ago, and after a career of accomplishment, Bradbury Thompson decided to redesign the entire Bible, every line, every page. The monumental project draws to a successful conclusion this summer with the completion of the Washburn College Bible.

One of the most interesting things about the project is Bradbury Thompson himself. Born and educated in Kansas (and a graduate of Washburn University of Topeka), he designed scholastic yearbooks and other books and magazines for a few years and then migrated to New York to work for a printer and the Westvāco Corporation. He served in World War II with the Office of War Information, for which he designed two of its magazines, *Victory* and *USA*.

The next 30 years of Thompson's life were spent on a variety of design assignments. He is responsible for 37 U.S. commemorative stamps, including seven of the last eight religious Christmas stamps (pp. 76-77). He has designed innumerable books, most notably the American classics sent at Christmastime to its friends and patrons by Westvāco. He was design director of *Art*

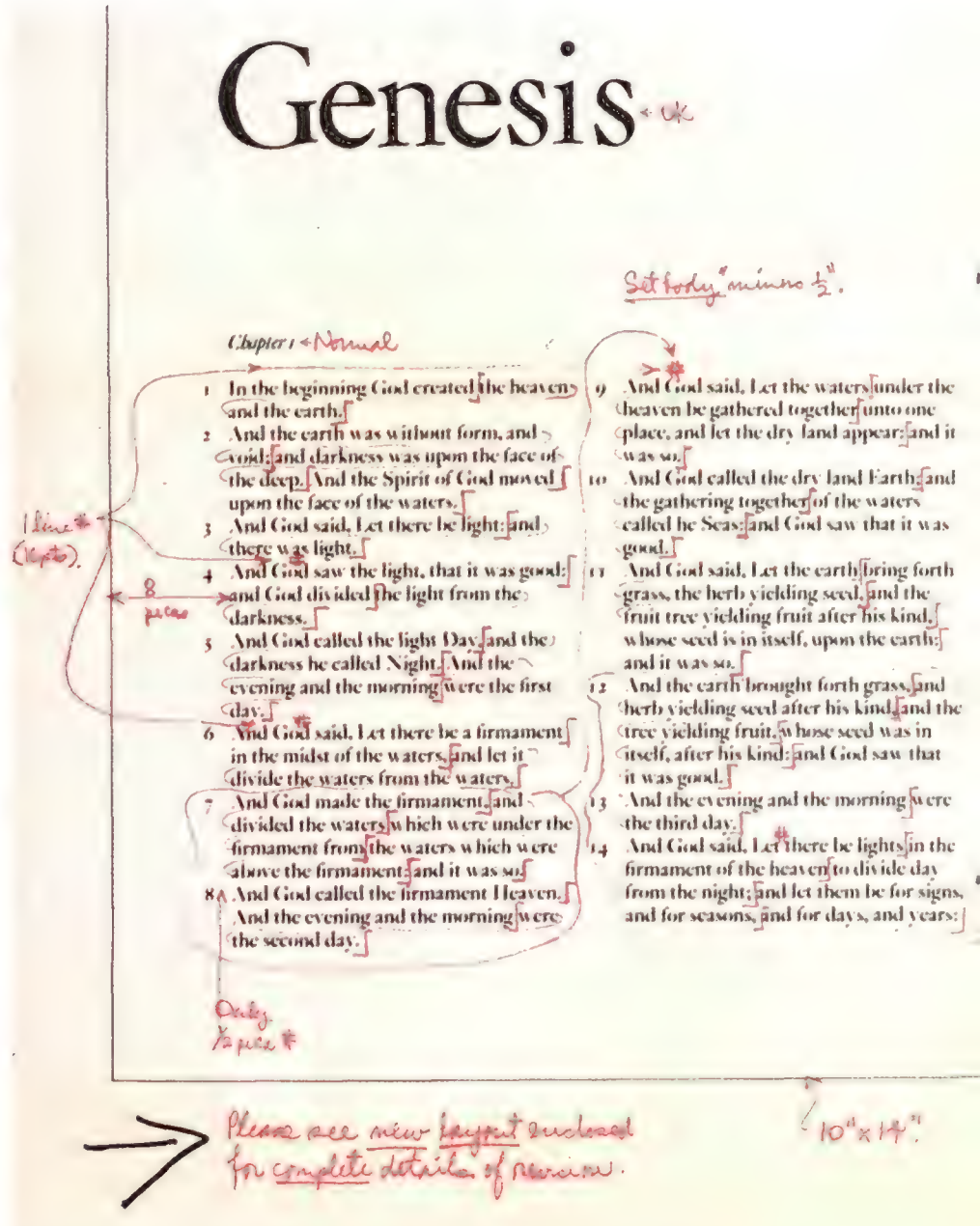
Doris Grumbach, a free-lance writer and critic, is author of the new novel Chamber Music.



Genesis I

In principio creauit deus celum & terram. Terra autem erat inanis & uacua: & tenebre erant super faciem abissi & spūs dei ferebat super aquas. Dixitq; deus. Fiat lux. Et facta est lux. Et vidit deus lucem q̄ esset bona: & diuisit lucem a tenebris. appellauitq; lucem diem & tenebras noctem. Factumq; est uespere & mane dies unus. Dixit q̄q; deus. Fiat firmamentum in medio aquarū: & diuidat aquas ab aquis. Et fecit deus firmamentū: diuisitq; aquas que erāt sub firmamento ab his q̄ erant super firmamentū. & factum est ita. Vocauitq; deus firmamentum celum: & factum est uespere & mane dies secundus. Dixit uero deus. Congregentur aque que sub celo sunt in locum unum & appareat arida. Et factum est ita. Et uocauit deus aridam terram: congregationesq; aquarū appellauit maria. Et vidit deus q̄ esset bonum. & ait. Germinet terra herbā uirentem & facientem semen: & lignum pomiferum faciens fructum iuxta genus suum. cuius semen in semetipso sit super terram. Et factum est ita. Et protulit terra herbā uirentem & facientem semen iuxta genus suum: lignumq; faciens fructum & habens unumquodq; semen secundum speciem suam. Et vidit deus q̄ esset bonum: & factum est uespere & mane dies tertius. Dixitq; rursum deus. Fiant luminaria in firmamento celi. & diuidant diem ac noctem: & sint in signa & tempora & dies & annos. ut luceant in firmamento celi & illuminent terram. Et factum est ita. Fecitq; deus duo luminaria magna: luminare maius ut preesset diei & luminare minus ut preesset nocti & stellas. & posuit eas in firmamento celi ut lucerent super terram: & preessent diei ac nocti. & diuiderent lucem ac tenebras. Et vidit deus q̄ esset bonum: & factum est uespere & mane dies quartus. Dixit etiam deus. Producant aque reptile anime uiuentis & uolatile super terram sub firmamento celi. Creauitq; deus cete grandia. & omnem animam uiuentem atq; motabilem quam produxerāt aque in species suas. & omne uolatile secundum genus suum. Et vidit deus q̄ esset bonum. benedixitq; eis dicens. Crescite & multiplicamini. & replete aquas maris. auesq; multiplicentur super terram. Et factum est uespere & mane dies quintus. Dixit quoq; deus. Producat terra animam uiuentem in genere suo. iumenta & reptilia. & bestias terre secundum species suas. Factumq; est ita. Et fecit deus bestias terre iuxta species suas. iumenta & omne reptile terre in genere suo. Et vidit deus q̄ esset bonum. & ait. Faciamus hominem ad ymaginem & similitudinem nostrā. & presit piscibus maris. & volatilibus celi & bestiis uniuersq; terre. omnique reptili q̄ mouetur in terra. Et creauit deus hominem ad ymaginem suam. ad ymaginem dei creauit illum. masculum & feminam creauit eos. benedixitq; illis deus. & ait. Crescite & multiplicamini & replete terram. & subicite eam. & dominamini piscibus maris. & volatilibus celi. & uniuersis animantibus que mouentur super terram. Dixitq; deus. Ecce dedi uobis omnem herbam afferentem semen super terram. & uniuersa ligna que habent in semetipsis semen generis sui. ut sint uobis in escam & cunctis animantibus terre. omnique uolucri celi & uniuersis q̄ mouentur in terra. & in quibus est anima uiuens. ut habeant ad uescendum. Et factum est ita. Vidit deus cuncta que fecerat. & erant valde bona.

Reduced-size copy of the first page of Genesis from Library of Congress' Gutenberg Bible, printed with Gothic type on vellum about 1450.


Genesis
Set body minimo ½".
Chapter 1 Normal
1 In the beginning God created the heaven and the earth.
2 And the earth was without form, and void; and darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters.
3 And God said, Let there be light: and there was light.
4 And God saw the light, that it was good: and God divided the light from the darkness.
5 And God called the light Day, and the darkness he called Night. And the evening and the morning were the first day.
6 And God said, Let there be a firmament in the midst of the waters, and let it divide the waters from the waters.
7 And God made the firmament, and divided the waters which were under the firmament from the waters which were above the firmament: and it was so.
8 And God called the firmament Heaven. And the evening and the morning were the second day.
9 And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so.
10 And God called the dry land Earth; and the gathering together of the waters called he Seas: and God saw that it was good.
11 And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so.
12 And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good.
13 And the evening and the morning were the third day.
14 And God said, Let there be lights in the firmament of the heaven to divide day from the night; and let them be for signs, and for seasons, and for days, and years:
1 line * (opt).
8 pica
Only ½ pica *
Please see new layout enclosed for complete details of revision.
10"×14".

Bradbury Thompson's first revision of his modern two-column format, King James Version, as it was returned to the typesetter in November 1969.

Gutenberg, in 19th-century engraving, displays to his patron the proof of a sheet of his Bible.

Thompson inspects proofs of the Old Master paintings which illustrate *his* Bible.

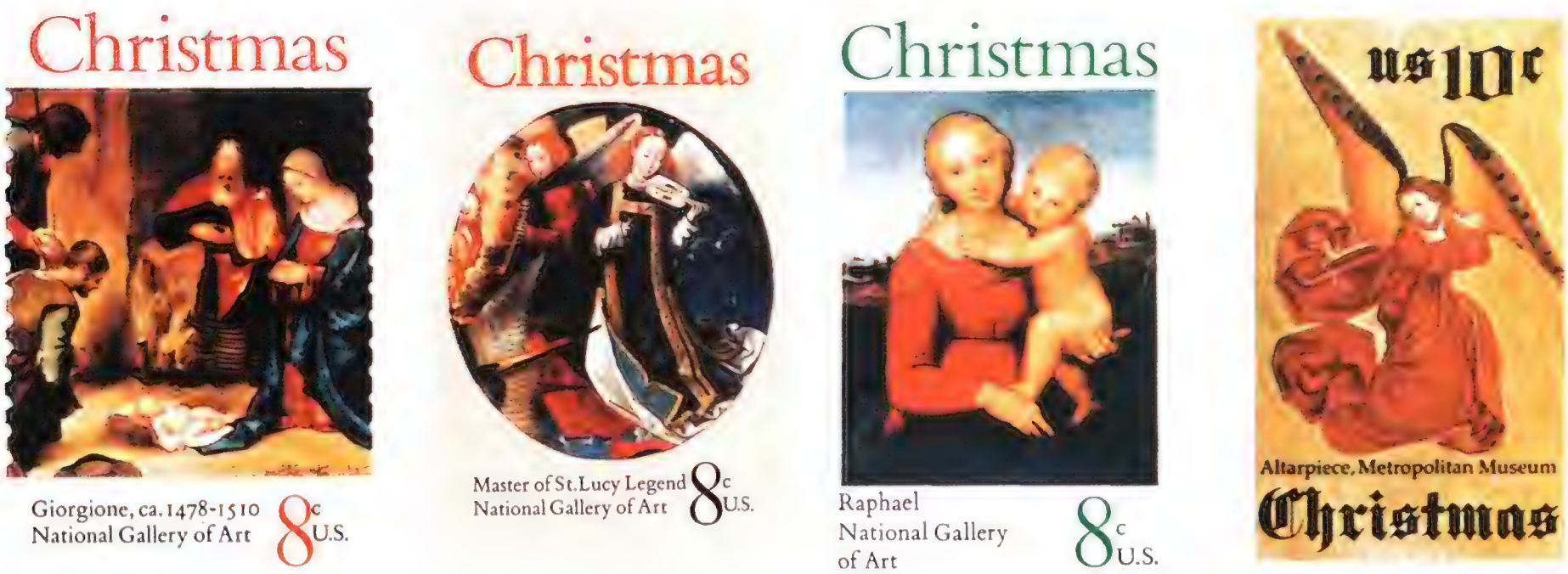
A new edition of the Great Book

Introitus, a print by the late modern master Josef Albers, serves as frontispiece of Volume I.

News and *Art News Annual* for 27 years. Ten years ago he designed SMITHSONIAN magazine so successfully that its appearance has not changed substantially since. He is a visiting professor in the graphics program at Yale.

A handsome, self-deprecating man in his mid-sixties, Thompson (p. 75) does his work in a comfortable Connecticut country house. It is here that, for the past ten years, he has been laboring over his new design for a Bible, an enterprise so vast that, in some ways, it parallels Gutenberg's efforts.

Before 1450 Bibles were written by monks' hands in a script we now call Gothic style, a script which Johann Gutenberg, in Mainz, Germany, used about 1450 to design his movable cast type for the first



Christmas stamps, designed by Thompson, from left: 1971, Giorgione's *Adoration of the Shepherds;* 1972, *Mary Queen of Heaven,* detail, by unknown artist; 1973, detail of Raphael's *Madonna and Child;*

printed Bible (p. 74). This Latin Bible was, of course, a magnificent book. But the Gothic type was hard for gravers with chisels to cut into steel letter punches. So type designers after Gutenberg began to emulate more geometric Latin letters, especially the capital letters they saw on monuments of ancient Rome. In 16th-century France, Claude Garamond devised a Roman typeface so clear, readable, graceful and yet substantial that it has been reproduced again and again in the centuries since it first appeared. It was updated in 1967 for modern metal casting by Jan Tschichold in Switzerland, who named it *Sabon Antiqua*. Now, utilizing the new technology of computer-programmed phototypography, Brad Thompson has chosen Tschichold's version of Garamond's 400-year-old typeface for his new Bible, which is being printed and bound in Tennessee by the Kingsport Press.

The Bibles printed since Gutenberg have followed his elegant if somewhat claustrophobic page design, and sometimes even his Gothic-style typeface. Gutenberg set his lines with absolute regularity, 42 lines to a column (except for a few pages), two columns to a page, and every line of exactly equal length, flush to both left- and right-hand margins. Esthetically beautiful, the result was difficult to read, very hard for the minister or lector in the pulpit to find his place. Gutenberg used a fine paper (also some vellum) that has withstood all ravages of time except one: it was seductive to worms.

The eloquent King James Version of the Bible, which Thompson uses, was first printed by Robert Barker in 1611. It showed little improvement visually. The superb English verses were separated, it is true,

Benefactors are Olive White Garvey (left), and daughter, Ruth Garvey Fink, head of Bible Committee.

but the essentially strict concern for margins (this is called "justification" in printing, a sturdy theological term) was maintained, and the typeface used was close to the Gutenberg script, ignoring the typographical advances into Roman type that had been made the century before.

In the 20th century a number of distinguished Bibles have been designed, most of them for typographic effect. The Doves Press Bible, printed in London in 1903-1905, contains a solid, unbroken page of type, interrupted only by small, bold devices that separate the verses. In 1925 Francis Meynell designed the Nonesuch Bible in England, now a collector's treasure.

Ghirlandaio: National Gallery
Christmas US postage

Andrea della Robbia: National Gallery
Christmas USA 15c

1974, detail of 15th-century work by unknown French artist; 1975, *Madonna and Child* by Ghirlandaio; 1976, Copley's *Nativity*, painted in London in 1776; 1978, Andrea della Robbia's *Madonna and Child*.

6 And Jesse begat David the king;
and David the king begat Solomon
of her that had been the wife of Urias;
7 And Solomon begat Roboam;
and Roboam begat Abia;
and Abia begat Asa;

8 And Asa begat Josaphat;
and Josaphat begat Joram;
and Joram begat Ozias;
9 And Ozias begat Joatham;
and Joatham begat Achaz;
and Achaz begat Ezekias;
10 And Ezekias begat Manasses;
and Manasses begat Amon;
and Amon begat Josias;
11 And Josias begat
Jechonias and his brethren,
about the time they were carried away
to Babylon:

12 And after they were brought to Babylon,
Jechonias begat Salathiel;
and Salathiel begat Zorobabel;

13 And Zorobabel begat Abiud;
and Abiud begat Eliakim;
and Eliakim begat Azor;
14 And Azor begat Sadoc;
and Sadoc begat Achim;
and Achim begat Eliud;
15 And Eliud begat Eleazar;
and Eleazar begat Matthan;
and Matthan begat Jacob;

16 And Jacob begat Joseph
the husband of Mary,
of whom was born Jesus,
who is called Christ.

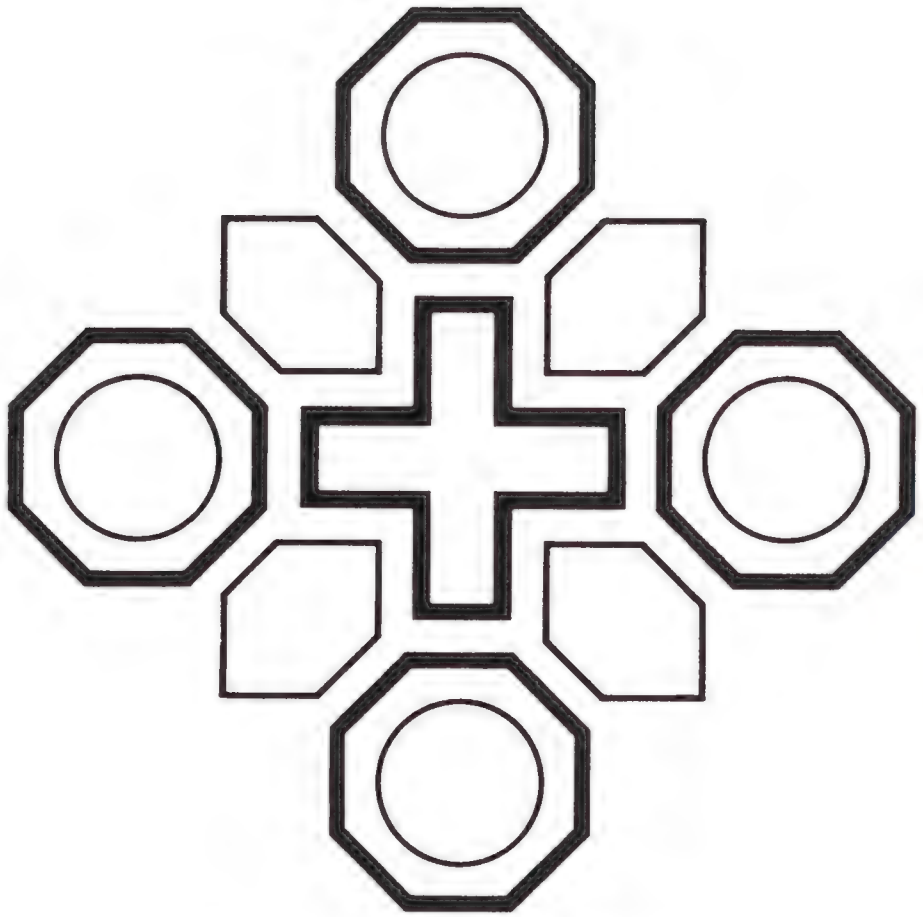
Magnificent stained-glass lancet window at Chartres illustrates sometimes formidable "begat" passages of Matthew I, starting with verse six (above). Known as the *Tree of Jesse,* Jesse appears at base; Virgin Mary toward top, above ancestors; Christ is shown as a flower, crowning the tree.

But this Bible never served the public well, because its columnar approach to the text made reading difficult.

The Oxford Lectern Bible—the Authorized Version (King James)—executed by the American designer Bruce Rogers in 1935, achieves many of the requirements of legibility. Still, the paragraphing is heavy because the verses and their devices are placed consecutively in the long sections rather than parted from each other in some more clarifying way.

So, with more than 500 years of Bible-printing history behind him, Bradbury Thompson decided to attempt an entirely new approach. "I decided not to copy the past, since past Bibles offered no real answers to making a new Bible readable today. My concern was for the immediate availability to the eye and the ear of the words. I wanted the pages to look beautiful, yes, but it was more important to me to suggest to the reader the natural and proper breaks in the prose, so that the reading would make sense to the listener in the pews as well as to the student of the Bible," Thompson says.

His idea was that it would be possible to make the Bible perfectly legible by using a large page (10-by-14 inches) on which the words would be set in the most readable Roman type available (pp. 72-73). He chose the adapted Garamond in a large font—14 point. (This is 14-point type.) Most important, he arranged the text in phrases, one, or a few, to a line, separated where the reader would naturally hesitate or stop. From



Ancient cross design, first found in fourth-century A.D. mosaics, decorates cover of each volume.

the pulpit the reader will find it possible to achieve a cadenced, even a poetic reading.

The volumes are enhanced by the addition of 66 masterpieces of art, one for each book of the Bible, selected by the director of the National Gallery of Art, J. Carter Brown, from collections throughout the world.

Further artistic embellishment is provided by Josef Albers. Three original screen prints, executed especially for the new Bible by the artist shortly before his death, and signed, dated and numbered, serve as frontispieces to each volume. They are suggestive abstractions. The first, for example, called *Introitus* (p. 76), is in the yellow color suggested by "Let there be light,"

Panel of Rogier van der Weyden polyptych, *The Last Judgment,* illustrates Revelation I:8 (right). Christ raises hand in blessing; St. Michael weighs souls.

8 I am Alpha and Omega,
the beginning and the ending,
saith the Lord,
which is, and which was,
and which is to come,
the Almighty.

and it calls to one's mind the vast interior of a great cathedral.

When I began to study the designed pages for the Thompson Bible, I thought I would need different criteria from those I use for trade books, but they were not necessary. What I look for in book design is harmony among all the elements of the work: suitability and size of type; pleasant and sensible arrangement of the type not only on the page but on the spread of two pages as the printed matter lies open; a marriage of color and design and type on the endpapers; the cloth of the covers; the graphics—whatever; in fact every aspect that contributes to the pleasure and ease it affords the eye and the hand. All these criteria work for this Bible.

There is a fine feeling of unity about the books as a whole. Type choice, art work, design of the page, and decoration all combine to make the Washburn College Bible both useful and esthetically pleasing. Symbolic of this unity is Thompson's use of a device suggested to him by his son, D. Dodge Thompson. It is embossed on the front covers of each volume and used on the end papers and the title pages: an ancient geometric pattern used in later church architecture but derived from the mosaic of Santa Constanza and dating back to A.D. 350, a cross surrounded by six- and eight-sided figures (above).

Because of its size and hefty price—$2,500 for the three volumes—the Washburn College Bible in its present form is clearly destined for pulpit use. But institutions such as colleges, libraries and museums, as well as private collectors of fine press books, will be tempted to acquire copies. Thompson says there are plans afoot to make a less costly and smaller (six-by-nine-inch) version of the large Bible which "will invite use for private devotions," as the preface puts it.

The new Bible has been named for its current sponsors and Thompson's alma mater. The Washburn College Bible came to be after a long search for backing. Thompson eventually returned to his hometown, Topeka, and interested Olive White Garvey, a former member of Washburn College's board of trustees, in his projected Bible. With their combined financial support, Brad Thompson came home. The boy who had, in 1934, edited and designed the yearbook for his class, brought his Bible to the College. It is from Topeka, Kansas, that the first 398 limited-edition copies will be issued this summer.

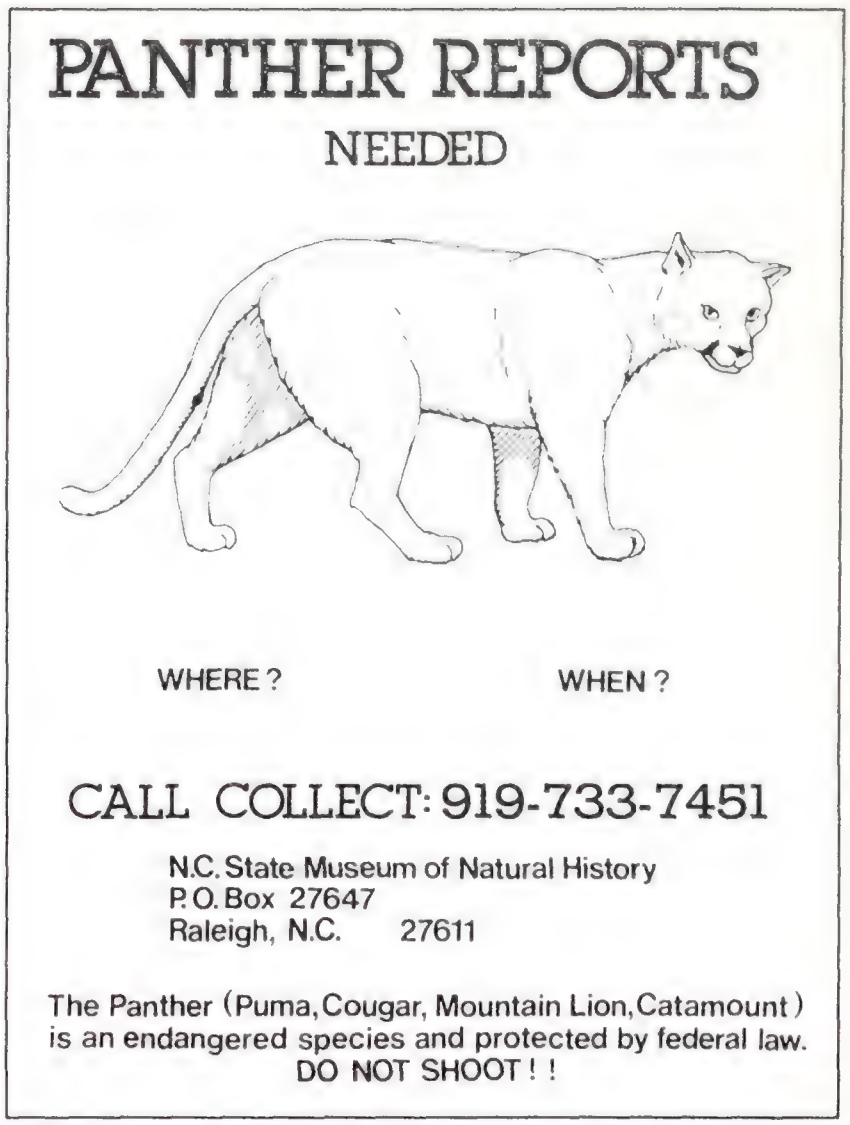
Hôtel-Dieu, Beaune, France

After release in Florida Everglades, this zoo-bred panther took what may have been its next to last look at human beings. Game officials reported it was found shot to death a short time later.

By Michael Frome

Panthers wanted– alive, back East where they belong

Mountain lions were long considered extinct in the Appalachians, but now each season brings new reports of the track of the big cat



Posters like this throughout North Carolina have produced more than 300 sighting reports since 1976.

On a July evening in 1975, five Great Smoky Mountains National Park maintenance workers were lounging on their bunkhouse porch watching a doe and two yearlings. Suddenly the deer fled into the forest and a large, grayish cat with a long tail emerged from the woods and bounded after them. The five men followed quickly, but found nothing more than tracks along a creek. They were convinced, however, that they had seen a panther hunting its traditional prey.

The report they filed in late September 1975 triggered a new sense of awareness of the largest, rarest and most secretive of the wild American cats. The Eastern panther was thought long ago to have followed the trail into oblivion of the great auk, Labrador duck, heath hen, passenger pigeon and sea mink. Recent sightings by some professional biologists, wildlife personnel, and forest and park rangers show this may not be the case. The Eastern panther may be coming back from the brink of extinction for a second chance.

For me the news was especially exciting. For years I've been an aficionado of the Great Smokies, the half-million-acre mountain sanctuary astride the North Carolina-Tennessee border. More than 15 years ago I had asked the then park naturalist about reintroducing the panther into the Smokies. After all, national parks are supposed to be wildlife sanctuaries and I can't think of any better suited for such a role than the Great Smoky Mountains. Fifty years ago, or less, it was not uncommon for mountaineers to catch sight of the sleek panther (or "painter" in the vernacular) three or four times a year, or to hear its shrill song pierce the wilderness night, and the animal's hams and shoulders were the source of "painter bacon." Even now Panther Creek, Panther Mountain, Cat Run, Painter Branch and Painter Creek are familiar place names in the Smokies and neighboring Nantahalas across the Little Tennessee River.

The biologist to whom I had posed the question responded flatly that the big cat requires too much room even to be considered for reintroduction, and that its day in these mountains was definitely done.

Now we know better. "It appears that nature has succeeded where the National Park Service feared to tread," Boyd Evison, who was the park superintendent (and who has personally seen panther tracks), conceded quite willingly when I was last in the park. "There seems no reasonable doubt that there *are* cougars in the park; and it seems likely that they have been here for some time. Very little seems to be known about their habits and needs in this kind of country, but the park, if kept free of excessive development, offers the best sanctuary for cougars north of the Everglades and east of the Rockies."

The 1975 observation in the park and concurrent

The return, perhaps, of the panther

Is the face (just left of center) that of a panther? The picture was taken in the Adirondacks in 1972;

reports of panthers along the Blue Ridge Parkway in North Carolina stimulated me to investigate the whereabouts of the big cat, one of the least known of North American mammals today, not only in the Southern mountains but throughout its range. I found these lonely wanderers of our mountains and forests far more widespread than I could possibly have dreamed. The numbers of animals must be dangerously low, but they apparently are breeding and the long thread of life, though tenuous, remains unbroken.

Felis concolor, "cat all of the same color," varies from light brown or gray to soft reddish brown, or tawny, possibly changing with the season. In the United States and Canada there are 15 subspecies, all essentially the same animal. Many names have been given, including catamount (for cat of the mountain) in the Northeast, cougar in Canada, panther in the Southeast, mountain lion in the West, "el león" in the Southwest (to contrast with "el tigre," the jaguar), puma in South America, as well as red tiger, silver lion, mountain devil, mountain screamer, deer killer and king cat. Now it is known mostly as panther, puma, cougar, mountain lion or long-tail cat.

That unmistakable tail is as long as an African lion's, though the panther is only half the size of the king of cats. The average male weighs about 150 pounds, the female about 100, though a large animal may weigh 200 pounds and measure eight feet in length. Our American lion is lean and lithe, endowed with tough skin, sharp claws and sharp teeth.

Though panthers are expert hunters, worthy of a sportsman's admiration, sport hunters long despised them as competitors for deer and played a key role in doing them in. "For the sake of deer supply," argued *Forest and Stream Magazine* in 1885, "the panthers should be systematically pursued and destroyed, and the bounty should be such as to encourage this." Likewise, when the nation's leading sportsman, Theodore Roosevelt, became President, he denounced the panther as "the big horse-killing cat, the destroyer of the deer, the lord of stealthy murder, facing his doom with a heart both craven and cruel."

Though deer are the main prey, a panther will eat almost anything. It does humans a good turn by devouring rabbits and rodents, but earns the wrath of stockmen by taking an occasional sheep or calf. Its diet includes porcupine, fox, skunk, badger, frogs, slugs, grasshoppers and even its little cousin, the wildcat.

In the late 1940s a Canadian biologist, Dr. Bruce S. Wright, equated the relationship between panther and deer and came up with a surprisingly hopeful forecast. Wright had observed new forests and abandoned farms developing into first-class deer habitat and hunters encouraging the increase in deer. He predicted that panthers would follow the deer back into new habitats in the East.

The Eastern panther in 1972, according to Wright, had passed the immediate danger of extinction, but

A revised edition of Strangers in High Places, *Michael Frome's book about the Great Smoky Mountains, is to be published later this year.*

the photographer believes what he saw was a panther, but picture is not considered conclusive.

This Western panther (only an expert can distinguish the subspecies) lives in a Pennsylvania compound.

only by "the merest fraction." He estimated the total number surviving in eastern North America, exclusive of Florida, at not more than 100 (with the largest number, 25 to 50, in New Brunswick) and possibly fewer, yet he foresaw the animal making a slow comeback in both the Southeast and North, from Florida to the Laurentians, providing it was given protection.

Despite reports of sightings up and down the Eastern seaboard during the 1960s, many government agencies and scientists remained dubious. Reports of panthers often turned out to be cats, dogs or spooks in the night. Even today some biologists concede only that the panther *may* exist and refuse to grant anything further in the absence of an acceptable photograph of the animal in the wild, a freshly killed specimen or a confirmed sighting by a scientifically trained observer. Ten years ago the official view of the National Park Service was simply stated: "There are no panthers in the Great Smoky Mountains." Anyone suggesting otherwise was subject to ridicule. Pranksters made things worse here and there by dropping the remains of a panther that had died in captivity, or by creating a trail with a dismembered limb. One or two footprints may be faked realistically, but not a whole trail complete with natural signs (p. 86), and a competent tracker can spot a fraud in a short time. But the pranks made the whole idea of living panthers seem like a fraud or joke.

Until recently, seeing one was a little like seeing the Loch Ness monster, a vision best kept to oneself. But not any longer. Reports of sightings are solicited rather than ridiculed. And instead of being a despised predator, the panther is increasingly viewed as a prized species that must be rescued from extinction.

Field Biologist Robert L. Downing has begun a five-year project, funded jointly by the Forest Service and Fish and Wildlife Service, to search for panthers and panther signs in the Southern mountains. From his headquarters at Clemson University, South Carolina, Downing has established a network of contacts among state and federal resource agencies to help screen, and validate, sighting reports.

One of the first submitted to him, a photograph of a panther track, came from West Viriginia early this year. "It's the first I've seen personally and I'm pretty positive it's authentic," he told me.

The three national park units in the Appalachians—Great Smokies, Shenandoah and the Blue Ridge Parkway—are cooperating with Downing in the search for cats, tracks and scats. A young Virginia outdoorsman and expert tracker, Champlin Carney, has been hired to search Shenandoah for tracks and to attempt to obtain photographs using a self-tripping camera.

So goes the search in southern Appalachia, but it's not the only area of interest and activity. New Hampshire officials are cautious believers: "Although none has been authenticated, enough sightings have been

The return, perhaps, of the panther

reported by people of good judgment that our department now considers there is a distinct possibility that the mountain lion is making a comeback in our state," says a spokesman for the New Hampshire department of game management.

Reports have been made continually in Massachusetts. West Virginia has stronger evidence. In April 1976 a young 100-pound male was shot by a farmer near Droop Mountain State Park after he saw it attacking his sheep. Though several sightings have been reported in the rugged high forests of Pocahontas County, this was believed to be the first panther killed in West Virginia in at least 50 years. One week later a second mountain lion was located on another Pocahontas County farm. The cats may have been wild or released by someone; yet sightings in relatively undeveloped areas, particularly in national forests, argue against the oft-expressed idea that all such animals must be "escapees from captivity." Besides, there aren't that many zoos or keepers of pet panthers in the Appalachians.

Blue Ridge Parkway rangers reported seeing a mother panther and two cubs near the Pisgah campground on at least two occasions as recently as 1977, a single panther near Frying Pan Tower Lookout, one of the wildest sections of the Blue Ridge, and another single panther at Gales Mine Falls, at the edge of the Asheville watershed.

In the Great Smokies, Ray DeHart, a retired trails foreman of the national park, within the past five years has seen three panthers on hiking trails—including one chasing a wild boar along the Appalachian Trail.

Lions clearly have learned to avoid men. They are shy but inquisitive about humans and sometimes like to be around them, sometimes seen, sometimes unseen, like phantoms. The panther seems to be a puzzling combination of what humans call courage and cowardice. Smaller cousins, the wildcat and lynx, are much more ferocious when cornered or trapped. The panther might attack a bear one day and run from a small dog the next. Complaints of depredation are surprisingly few, and so are unprovoked attacks.

At present the Eastern panther either survives, or may possibly survive, in south central Canada and northern Maine, the White Mountains, isolated areas in Massachusetts, the Adirondacks, the Appalachian

Tracker Champlin Carney explores possible panther den.

Pads in foreground cover camera trip wires set up on deer trail in Virginia.

White blobs are plaster casts drying on a panther track trail.

Mountains from western Pennsylvania down through Alabama, lowlands of South Carolina and Georgia, southern and central Florida, hardwood bottomlands of northern Louisiana, and the Ozarks of southern Missouri, Arkansas and eastern Oklahoma.

Firm, conclusive data are very difficult to come by. The Eastern panther has been photographed alive only in Florida, with one possible exception. While tramping in the Adirondacks in 1972, Alex McKay, a New Yorker, saw a huge cat stalking silently about 20 feet ahead of him. The cat, seeming to sense him simultaneously, crouched low in the grass and stared with yellow-almond eyes. McKay raised his camera, snapped the shutter (p. 84-85) and looked down briefly to wind the film. When he looked up again the big cat had vanished.

The single picture he had taken revealed only a feline head with dark cheek patches, a clear muzzle, those glaring almond eyes, and the faint outline of the body crouched in the grass. The State Museum in Albany advised him that a photo is not acceptable documentary evidence; only the fresh skin of a specimen could be considered authentication of the animal's occurrence—yet it's against the law to collect the skin of an endangered species.

Loose lips kill cougars

Many biologists and wildlife officials shun discussion of the Eastern panther. They seem to fear that recognizing the animal's existence would encourage hunting, regardless of its status as an endangered and protected species. They could be right. "The greatest danger to the panthers today," wrote Bruce Wright, "is from the 'shoot it to prove I saw it' philosophy." And Aldo Leopold's first response 30 years ago on learning that panthers survived in New Brunswick was: "We must not tell anybody."

In a recent study undertaken for the United States Forest Service, biologist George Lowman urged complete protection as "the most necessary step" for management of the panther in the East.

National forests in the White Mountains, Green Mountains, Southern Appalachians, Florida and the Ozarks all are designed to serve many purposes, including wildlife preservation. In places national forests border national parks, including Shenandoah, the Blue Ridge Parkway and Great Smoky Mountains, and are like extensions of them.

"As much of each national forest as possible should be maintained in unbroken undisturbed tracts," urged Dr. Lowman. "Certainly any type of habitat reduction should be avoided."

Among the states, North Carolina has moved with particular zeal. In 1971 it granted complete protection.

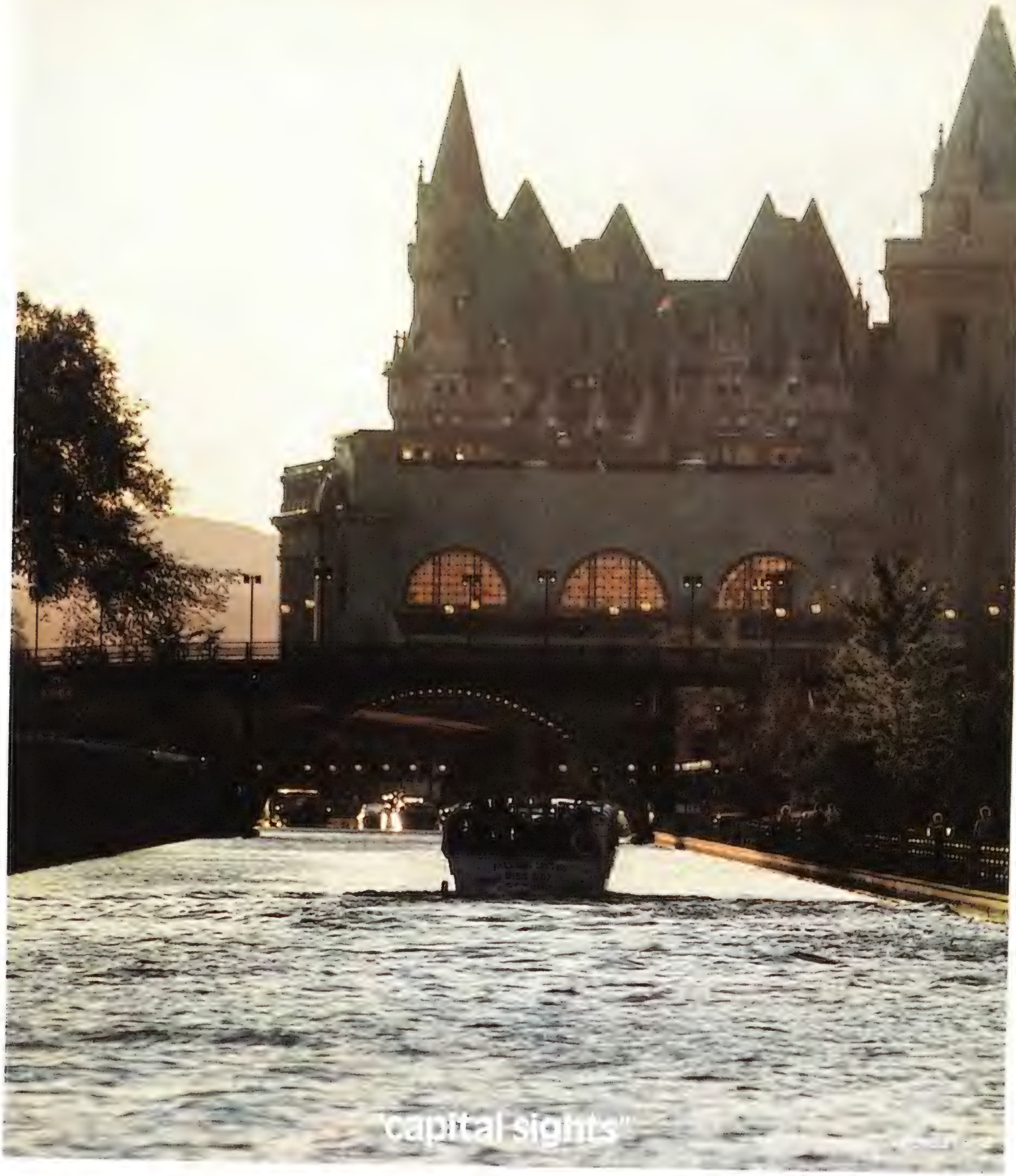
Carney, holding fresh plaster casts of panther paw prints, was hired to find and photograph them.

Two years later Dr. Frederick S. Barkalow jr., professor of zoology at North Carolina State University, began to solicit photographs or casts of tracks. Most recently the North Carolina State Museum of Natural History issued 1,000 posters (p. 83) as part of the first statewide effort to obtain reports.

With passage of the Endangered Species Act of 1973, federal agencies are obligated to give priority to saving the panther and its habitat. The Blue Ridge Parkway and Great Smokies National Park top the list because evidence of the panthers' presence there is so strong.

As Boyd Evison, who is now Assistant Director of Operations for the National Park Service, puts it: "The cats' only real enemy is Man and we will do what we can both to prevent poaching and minimize 'people activities.' You and I may not see one of these lions, but knowing they are there means a lot to us."

A two-week-old Western panther pet scrambles onto log in Pennsylvania



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Tethered on outskirts of Albuquerque, New Mexico, Sunstat is buoyed up by the rays of the sun after its historic flight. Balloon's transparent side focuses the sunlight on its dark side, which serves as a collector.

By Carol Havens

The sky's the limit in a solar balloon

Iranian inventor's buoyant conveyance, powered by the sun, could be the harbinger of a new generation of aircraft design

When Frederick Eshoo climbed into the gondola of his hot-air balloon and floated aloft over Albuquerque, New Mexico, at dawn, the only sounds that could be heard were Eshoo's own cheers. He had good reason for jubilation, beyond the normal exhilaration a hot-air balloonist feels on lifting off. For Eshoo was piloting a unique balloon, his own invention, which rose to an altitude of 12,500 feet and stayed up four hours, 10 minutes and 17 seconds, using the most economical of all fuels—the heat of the sun's rays.

Eshoo, an Iranian paper manufacturer and inventor who claims to be the Middle East's only balloonist, spent more than two years designing the balloon and testing materials that would make it an effective solar collector. He named the balloon Sunstat—a yoking together of the sun and aerostat, the technical term for a hot-air balloon—and he sees it as the harbinger of a new generation of aircraft and space vehicles whose flight will be powered by the sun.

Photographs by Vince Streano

Flight powered by the sun

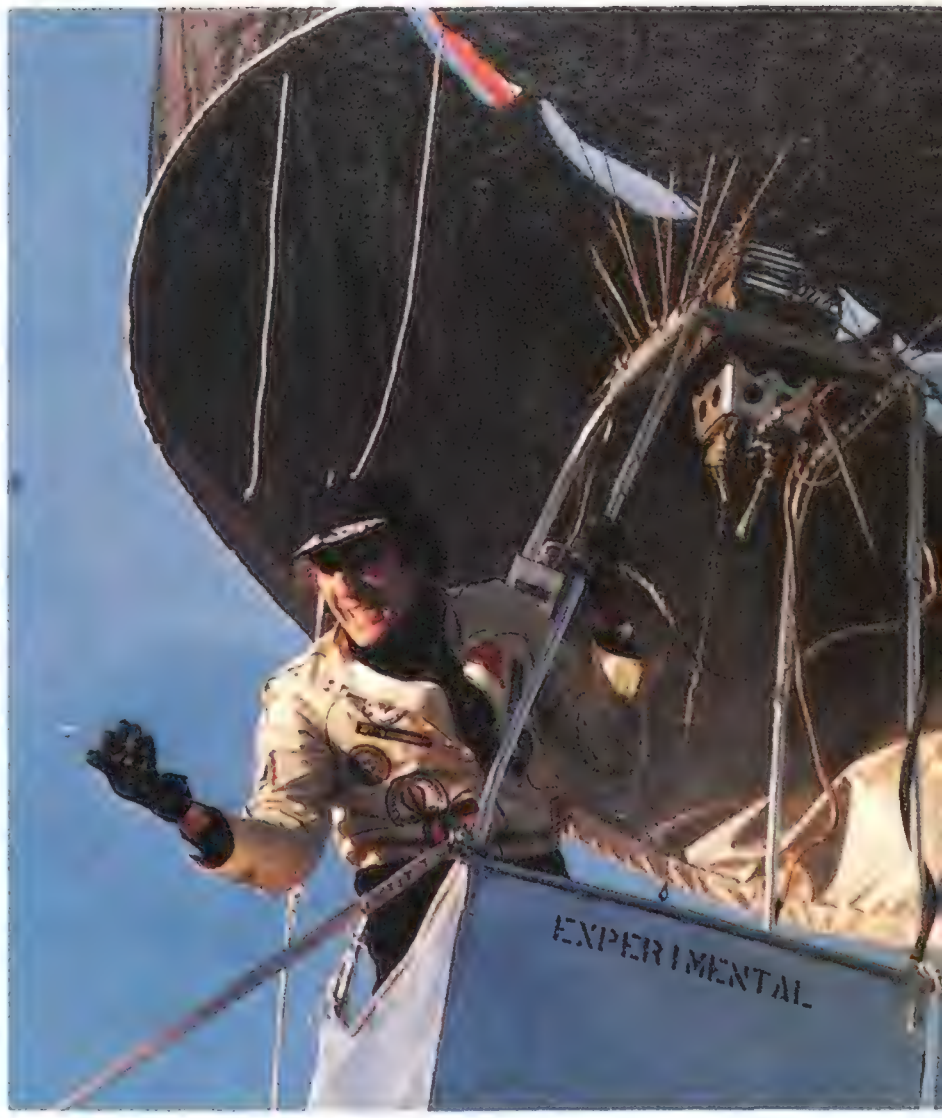
Eshoo, inside balloon as it is being inflated, inspects lines that adjust curtainlike collector.

Sunstat is surprisingly conventional in some respects. It utilizes the same simple physics as all hot-air balloons, rising when the air inside is heated and thus becomes lighter than the air around it. Its basic shape, too, is that of an ordinary hot-air balloon. This has changed little since 1783 when Joseph Michel Montgolfier, a French paper manufacturer, first filled a taffeta balloon and watched it carry two Parisians skyward. But Eshoo's Sunstat represents a radical break with tradition in the way its air is heated—by a burner that is 93 million miles away.

Montgolfier's marvel was kept aloft by adding straw to a firepot hung below the balloon's open neck. This method posed obvious risks of a conflagration, and limited the duration of a flight by the amount of straw that could be carried. As a result, many early balloonists preferred to adopt a rival technique of filling a balloon with hydrogen, a lighter-than-air gas which, however, is also highly flammable. Most modern hot-air balloons are equipped with propane burners instead of firepots to generate heat, but even this method imposes limits on how long the balloonist can stay aloft. As the weight of the propane tanks on board goes up, the balloon tends not to—so fuel can be carried for only two or three hours of flight, at most. It was this problem, as well as the periodic roar of propane jets intruding on the balloonist's solitude, which prompted Eshoo's interest in the sun as a heat source. "You come to just the right position when you're flying hot air," he says, "and you want to continue to fly the whole day. Then, pffft, the propane is finished and you land."

Eshoo was not the first to attempt the design of a solar-powered hot-air balloon. The first known solar flying machine, resembling a huge black tetrahedron, carried a man aloft in 1973. But, while the balloon's black surfaces collected enough heat to lift it, the con-

With collector drawn back to catch overhead sun, balloon soars over New Mexico ridges.



His experimental balloon straining at tether, Eshoo signals from the gondola that he is ready to fly.

traption was hard to maneuver and took a considerable time to warm up and rise again after venting, or cooling, lowered its altitude. Another attempt was made in England, with a cumbersome balloon-within-a-balloon: the inner one was black, the outer one transparent. In principle, this was supposed to produce a "greenhouse effect"—heat from the inner black surface would be trapped by the outer layer—but it never worked.

Eshoo succeeded where the Englishmen failed by incorporating both transparent and black surfaces into a single balloon. One side of Sunstat is transparent and, because it is curved, acts like a lens to focus sunlight on the opposite, black side of the balloon. The black side serves as a solar collector—absorbing the visible light rays of the sun and, as the surface warms, reradiating the absorbed energy as infrared rays or heat. As air circulates inside the balloon, it is heated on the black side and distributed throughout the sphere.

As the balloon heats up, the transparent side serves as both a lens and as insulation: the clear plastic transmits shortwave sunlight, allowing it in, but does not transmit infrared wavelengths, and so the heat is trapped inside.

Flight powered by the sun

Eshoo added a number of refinements to this basic design. The uppermost part of the black collector is actually a curtain which can be drawn to let more light in from above when the sun is very high; and, to compensate, a curtain can be spread at the base of the balloon to add collecting surface. To adjust Sunstat's altitude in flight, Eshoo had to control its orientation to the sun: when the transparent side faces the sun, the balloon heats up and rises; when the black side faces the sun, because its outer surface is a shiny layer which reflects light instead of absorbing it, the interior cools off and the balloon descends. Small, battery-operated propeller fans on either side of the balloon accomplish this, rotating the balloon in either direction as one or the other is switched on. As insurance, Eshoo also keeps a small propane burner on board in case sudden lift is needed to avoid an obstacle, or to assist in a windy landing.

A passionate aeronaut, the 49-year-old Eshoo says he has tried every odd flying machine and gadget he could find. "When I fly airplanes I fly well. But how can I fly better than the others? After a while everything becomes classic, with no development of your own skill." As a balloon pilot, he finds there is room to develop new skills. "Now I am slowing down in speed," he says, "but speeding up in the brain."

To Eshoo, Sunstat is not just for sport. "Why cannot solar balloons be used commercially?" he asks. "Larger volume, larger lifts, larger loads." All the energy, he points out, is free. "Every flying machine needs some energy to fly. I am just getting it from nothing. Just some cloth and some air."

Battery-driven propeller, one of a pair, rotates balloon toward sun or away, controlling its altitude.

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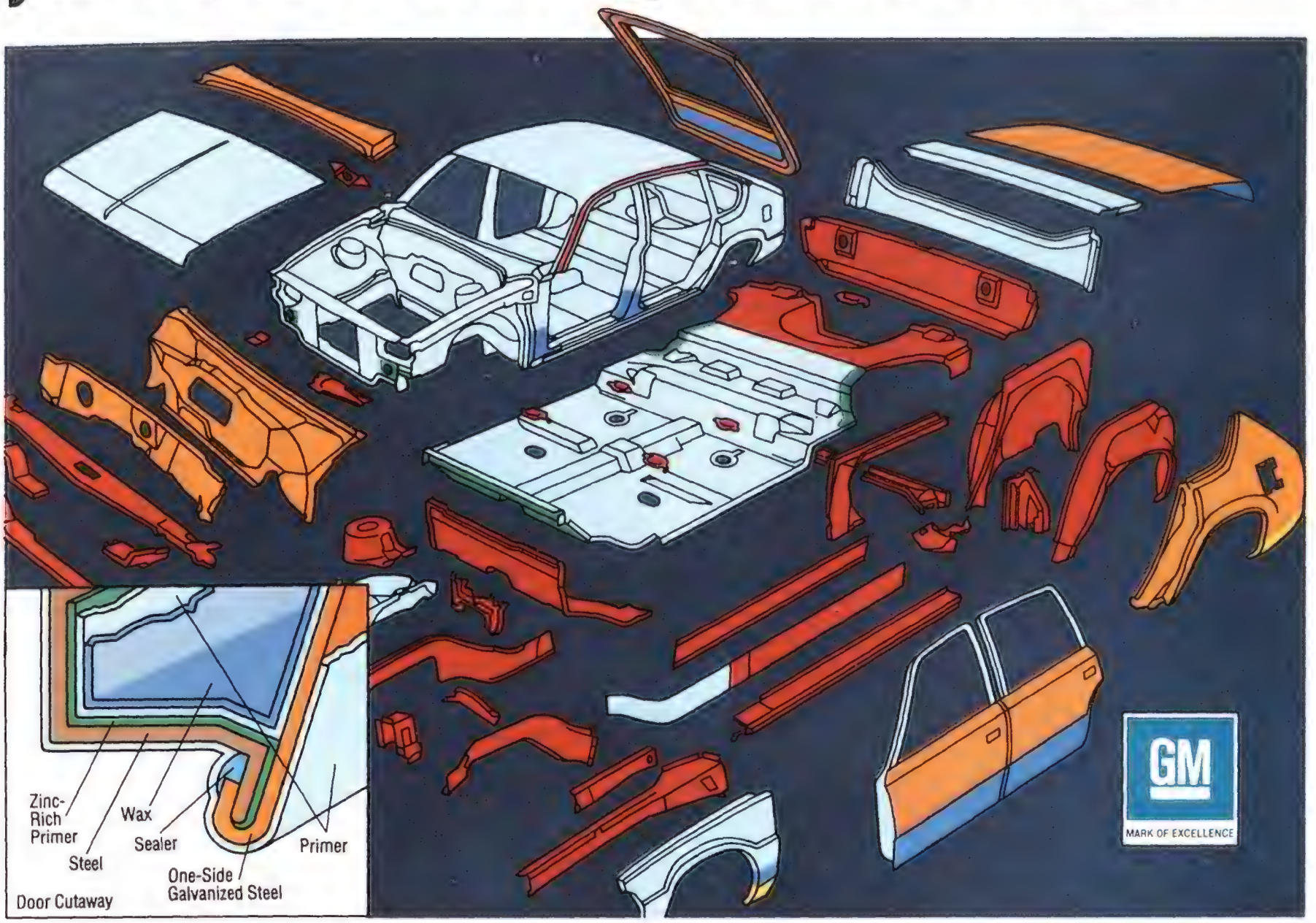

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Chestnuts from trees recently cured of blight are peeled by the Essartier family on a farm in southern France. The nuts once provided peasants of the region with a main source of nourishment in the wintertime.

By Rudolph Chelminski

A fungus beats the chestnut blight at its own game

Giving treated trees a checkup, researcher Jean Grente points out a canker cured of the blight.

Fighting against one plague with another, French save sick stands of their trees and raise some real hopes for America's

The chestnut blight, one of the most sweeping ecological disasters ever to hit this country's forests, destroyed every last stand of American chestnuts in just 40 years. Where specimens once towered 70 to 100 or more feet high, only seedlings now sprout from the roots and stumps of the blighted trees. But the seedlings, too, after a few years all show the fatal cankers of the disease, caused by a parasitic fungus.

American scientists have been trying to cure the blight, in vain, ever since it was introduced from the Orient and showed up in a grove of chestnuts at New York City's Bronx Zoo in 1904. So it comes as a surprise to hear a French agronomist named Jean Grente, better known for his research on truffles than chestnuts, remark quite matter-of-factly: "The American chestnut blight is vanquished. Yes, that's so."

For the past several years, Grente has been curing the blight on the European chestnut (*Castanea sativa*), a relative of the American species, and he believes that soon the indigenous American chestnut (*Castanea dentata*) will also spring back to life, as tall and healthy as only our elder generations can remember it, and once again will grace the uplands from Maine to Alabama.

The man who makes these happy ecological predictions, who discovered the remedy which has eluded scientists for three-quarters of a century, is the boyish, easygoing 57-year-old director of research at the Clermont-Ferrand Plant Pathology Station of the French National Institute for Agronomic Research (INRA). Lest he be taken for a scientific swaggerer, though, Grente hastens to add: "The blight has been defeated by nature, not me. I just found the way to do in ten years what nature does in 50 or 60."

Grente's laboratory on a hill above Clermont, in the Auvergne, occupies two modern apartments which he and his assistants have transformed into *Le Laboratoire de Lutte Biologique,* literally "The Laboratory of Biological Struggle." Preceding me to a windowless room where banks of glass shelves basked in the glare of fluorescent tubes at ideal fungus-growing temperatures, he seized a Petri dish in which a growing culture (technically, a developing thallus) was sending out a fanlike array of orange filaments.

"Endothia parasitica," he explained. "Virulent strain. This is what has been killing the chestnut trees." He picked up another of the disc-shaped plastic vessels, in which the filaments of the fan were almost perfectly white. "And this too is *Endothia parasitica,"* he said, "but it is a hypovirulent strain. This is what inhibits the virulent strain. The trick for saving the chestnut is to 'blight the blight.' In Italy, nature did it by herself. That permitted us to develop our process."

Once it had established itself in America, he explained, the blight didn't take long to cross the Atlantic. Grente believes it landed in Italy in 1917, with a cargo of American-chestnut mine timbers which had been discharged in Genoa. By the late 1930s, as hap-

Rudolph Chelminski, a Connecticut Yankee living in France, is a frequent contributor. He wrote on French artist Robert Tatin in the February issue.

Color photographs by Pierre Boulat

pened on the U.S. Eastern Seaboard, the blight was a serious problem in Italy, devastating trees in Tuscany, Piedmont and Campania.

Ironically, the Italian unpreparedness led to the remedy which has made Jean Grente something of a superstar in the plant-pathology business. Nature took a new course all by herself, but he was the one to seize upon it and apply it practically.

"The Italians did nothing," he said, "and we knew the blight would eventually come to France, so we paid attention. It was probably brought in by migrating birds, and we first spotted in it in the mid-1950s on a mountain pass in the Ardèche department. From the mountains it spread down to the rest of the Massif Central. We began treating as best we could."

French tree surgeons applied the mallet-and-gouge technique called curettage, removing the bark canker and covering the wound with a disinfectant. But this one-by-one approach was too slow to halt the blight, and INRA's teams were soon overwhelmed, just as their U.S. counterparts had been. Grente and his colleagues also tried to breed resistant strains of chestnut trees, but again with no more success than in America.

Abandoning the idea of hybrids, Grente then went to Italy where an exciting piece of news had come to light: some of the infected Italian trees had spontaneously begun curing themselves.

"It was called the Biraghi Phenomenon," he said, "after a Florentine plant pathologist named Antonio Biraghi, who had been watching infected trees for many years. Since the chestnut, like the oak, is an 'immortal' tree whose trunk and roots remain alive even after the tree has been felled—and since *Endothia* never attacks the subterranean portions of trees—the chestnuts which were dead aboveground continued to send out shoots from the bottom. They grew up as normal saplings until they were in turn attacked by

Chestnuts dwarf two woodsmen in North Carolina. Photograph was taken in 1910, before the blight struck,

in an area where the trees reached their greatest height and girth, up to 120 feet tall and 13 feet in diameter.

the cankers. The chestnut farmers cut them back. Biraghi observed through the years that after three or four cuttings the new cankers began to heal over, and he thought that this resistance had been provoked by the cutting."

He also noticed that seedlings from these trees showed similar resistance, and he concluded that the acquired characteristics had become hereditary. But that was straight Lamarckian-Lysenko theory—counter to Darwin, Mendel and all modern genetics. "That was too much," Grente said. "That was completely unacceptable to the scientific community. There had to be some other explanation."

Grente was the one who put his finger on the answer: a sick fungus, a new strain which had developed in the 40 or so years since the blight had devastated parts of Italy. Working with his colleague, Suzanne Berthelay, on bark samples which they had brought back to Clermont, Grente discovered the providential mutant by comparing cultures of fungi from lethal cankers with those from trees whose wounds had displayed the Biraghi phenomenon. It was just as in the two Petri dishes which he had held up for my earlier inspection: the virulent strain of *Endothia parasitica* was orange and robust, ready to go out and slaughter forests; but its attenuated cousin was paler and less vigorous, and no match at all for a tree's natural defense mechanisms. Cankers formed by the hypovirulent strain quickly became covered with new bark that was the arboreal equivalent of scar tissue and the weak fungus was invariably defeated.

The cure proved to be catching

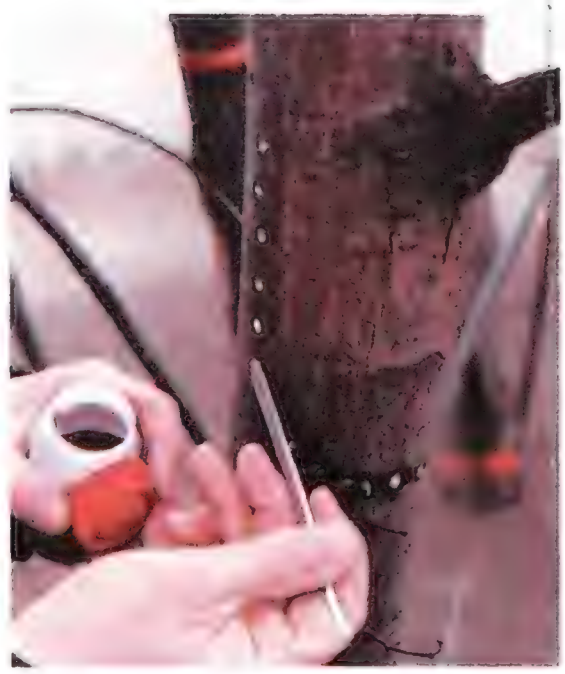
Even better, Grente found, the "blight of the blight" was contagious. To demonstrate this crucial discovery, he held up another Petri dish in which two tiny samplings of the virulent and hypovirulent strains had been placed side by side: the filaments of the original segments, orange on one side and white on the other, had grown together to form a new "fan," the color of paprika and milk.

"The virulent strain has been infected by the sick one," he explained, a process that occurs when the mycellial strands, or hyphae, of the two strains fuse (a form of union called anastomosis). "Now it has become hypovirulent. It has been rendered harmless."

Nature being what she is, Grente did not expect a single hypovirulent strain to be able to transmit its sickness to every virulent one. But by laboratory manipulations (he and his colleagues make some 90,000 matchings a year) he was able to create new hypovirulent strains, one of which was bound to be compatible with one of the fungi from bark samples regularly sent to him in Clermont from all corners of France.

Grente and assistant inspect chestnuts his method has saved.

In lab, hypovirulent fungi are tested, prepared as pellets (center).



Applying cure, Grente helps nature "blight the blight."

Once the compatible hypovirulent strains had been located in the lab and then injected into trees of blighted forests, hypovirulence became a veritable epidemic. The "blight of the blight" was transmitted from tree to tree by birds, insects, the wind—in short, by all the elements which had carried the original blight itself. This was of tremendous practical importance because it meant that the impossibly slow one-by-one approach of the primitive curettage technique could be replaced by a selective gridwork inoculation program of one tree in ten, sufficient treatment for the curing of an entire massif. As a result of Grente's brainstorming, France is presently engaged in a five-year, $1.5-million program which by now has treated a quarter of the country's chestnut growth.

To demonstrate the efficacy of *le système Grente,* the professor took me on a wintry ramble through some of the regions of southwestern France where the chestnut has been a traditionally important economic factor.

"Besides being a source of food and revenue, it is a *sympathique* tree," Grente said as we tramped through a thicket of diseased young chestnuts. His words echoed those of old Yankees whom I had often heard, as a boy in Connecticut, reminiscing about stands of chestnuts in the woods between the cow pastures.

Producing a little hole driller the size of an ordinary corkscrew, Grente selected one of the sick trees and meticulously punched a series of shallow apertures around the periphery of a canker, then produced from his pocket a plastic vial, the key to his demonstration. It contained several dozen pellets (above) about the size of lentils, the color and consistency of wet bread. They were, he explained as he introduced them into the apertures, bits of the mycelium of the hypovirulent strain, especially prepared for this purpose in his laboratory. When the holes had been filled, the treated canker looked like a neatly stitched wound. He covered the "suture" with masking tape to preserve the pellets' moisture and stood back to admire his work. Another chestnut tree had been saved.

Later, at the farm of Léon Essartier, he examined a grove of young chestnuts which had been treated by his one-in-ten process two years earlier. The trees looked good: healed and healthy, showing no signs of the ravages of *Endothia parasitica* beyond the scarred outlines of where the cankers had been defeated.

"This tree's been on television several times," said Essartier's son, Edouard, indicating a particularly spectacular scar formation with a touch of parochial pride. "It's a real star."

At lunch that day (the cook had turned out the ancient local specialty of blood sausage with chestnuts), Grente described his efforts to modernize the French chestnut industry and to promote its fruits. Pickled or candied chestnuts? Chestnut flour for cakes and cookies? Chestnuts as livestock feed? *Délice* of chestnuts for dessert? Soufflé of chestnuts? The ideas spun on and on, all of them suggesting that the chestnut is a species with a bright future in France.

In this country, of course, Grente's culinary fancies pale before the uses the tree was put to in its days of glory. Once the most important hardwood tree in Eastern forests, it provided us with everything from split-rail fences, telegraph poles and railroad ties, to roofing shingles and fine furniture. But Grente has high hopes for the American species, too.

His eyes (chestnut-colored, naturally) positively glow as he describes the exemplary cooperation be-

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tween his laboratory and those of several American confreres since he first sent samples of his hypovirulent strains to the Connecticut Agricultural Experiment Station in New Haven, to the College of Agriculture and Forestry of West Virginia University in Morgantown, and to other U.S. chestnut research centers. He recalls with particular emotion the American Chestnut Symposium in Morgantown, in January 1978, on the biological-control methods which he had pioneered.

The success of his methods, however, has proved hard to translate to the American situation. The hypovirulent strains which work on the European species of chestnut do not always cure the blight on American trees. Native hypovirulent strains have turned up in the wild here, and have been used to cure individual trees in experimental stands—but so far researchers have not induced the epidemic spread from tree to tree that would wipe out the blight effectively.

Native conditions may make this more difficult in the United States, where chestnuts were not cultivated in groves but were widely dispersed in the wild. Nevertheless, plant pathologists and geneticists here believe that Grente's technique of biological control will eventually work, and that before long they may have hypovirulent strains available for homeowners who want to save individual chestnut trees on their property.

Grente has no doubts about the chestnut's future. Looking at the healthy trees on the Essartier farm, and dining on their fruits, he confidently predicts that with further progress in biological-control techniques the chestnut blight will simply disappear from the Earth.

Saving the chestnut is not the only impressive accomplishment to spring from Grente's remarkable and uncanny intuition. When he made his surprising disclosure that the chestnut blight was "vanquished," he was already known to farmers in southern France—and gourmets the world over—as the man who had figured out how to cultivate the wild truffle. In doing that, he had accomplished what peasants, scientists and entrepreneurs had been trying to do since at least the time of the Romans: successfully seed, plant and harvest those black diamonds of gastronomy.

Truffles are the fruits of a fungus (*Tuber melanosporum*) which cannot grow on its own in the soil, but lives in mutually beneficial association with the roots of a host tree, usually oak or hazelnut. Traditional truffle grounds in southern France had flourished and gone barren and flourished again for centuries, making the mushroom's appearance seem an almost mystical gift. Truffle harvests—with peasants relying on the educated noses of "truffle pigs" (opposite) to sniff out mushrooms that were buried in the forest floor—became festive rituals.

When Grente announced in 1978 that he had inoculated oak seedlings with the fungus and cultivated truffles in his greenhouses at Clermont, the gastronomic world was startled. But Grente's seedlings are doing fine now in test farms around the Massif, and beginning to show their first yields, thus finally giving the lie to Brillat-Savarin's gloomy observation, recorded in his treatise *Physiologie du Goût* in 1825, that "the cleverest of men have turned themselves to the problem; and some felt certain they had discovered the seeds, and thus could multiply the truffle at will. Vain efforts and deceitful promises! Never has a harvest followed the planting. . . ."

Now, having given new life to the truffle and the chestnut, Grente is looking for other mysteries to solve. Somehow, projects that baffled other researchers in the past seem to work out for Grente, and he says he has a few more agronomic tricks up his sleeve. "Nature does things very well," he likes to say. "But to help her out, you've got to understand her."

Grente's earlier research earned him title of "Monsieur Truffe," or Mister Truffle. Here he has one in hand.

Truffle-hunting pig expertly sniffs them out. But, says Grente, a sniffing machine could replace pig.

A torturous-looking thing, but, with blunted needles, Joel T. Hart's Pointing Machine, dated about 1852, was the first device to trace live models. It was aptly called "crown of thorns."

Admiral Farragut sits, late 1860s, for photo-sculpture, in which 24 simultaneous photos were taken.

By Michele Bogart

In art the ends just don't always justify means

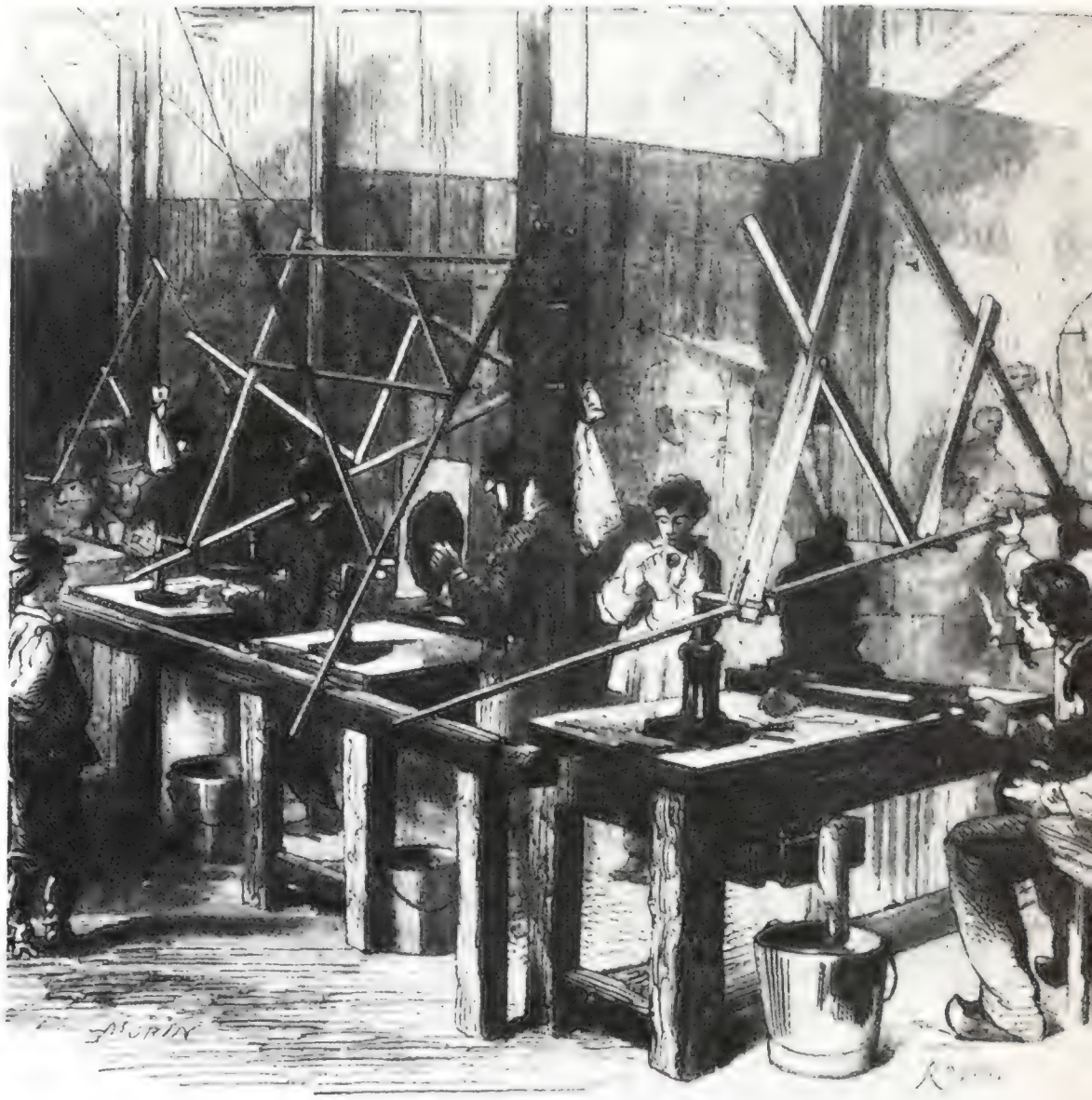
To make three-dimensional portraits, 'sculptors' of the 19th century tried to use machines. But even today 'reality' doesn't seem adequate

People are touchy about portraiture, either damning the artist for his accuracy or for his lack of it. Artists, too, are touchy, because "perfection" is elusive. Painters are forever caricatured as pouting over their creations while their subjects complain "there's something wrong with this mouth." And skilled as they were in the plastic arts, even the ancient Greeks and Romans were forced to resort to ex post facto tinkering with their works, applying molded wax to smooth a rough finish here or bring out a subtle detail there. Hence the old-fashioned explanation for the word "sincere" —from *sine cira,* or "without wax."

Early in the 19th century there arose a group of men who asked why bother correcting defects when, with a little applied technology, we should be able to create exact reproductions of any object—including the human form? These men, as Dr. Johnson would have said, were possessed by a single idea—and that was a wrong one. It was, nevertheless, a wrong idea whose time had come.

From the invention of James Watt's sculpture

Benjamin Cheverton's reducing machine, 1826, could make small versions of fine artworks.



François Willème's photo-sculpting studio in Paris, about 1870, a kind of art factory in which artisans split up a subject, each working on a section, tracing photo model.

machine in 1804 to the realm of computers and holography today, inventors, technicians, craftsmen and commercially minded businessmen have tried to keep the "I" out of art. That is to say, in their quest for a machine that would totally mechanize three-dimensional portraiture, they have sought to eliminate the need for time-consuming creativity and genius in the creation of sculpture.

The current decade has produced two very different technological descendants of the 19th-century attempts to produce sculpted likenesses, bypassing the artist. With "solid photography" the model poses before eight cameras that shoot simultaneously from different angles. The film is specially processed, coded by a computer that feeds the correct dimensions into a carving machine. Solid photography comes to us rather directly out of a late 19th-century sculpturing method called photo-sculpture.

Holography is a more unusual branch of the art, resulting in no sculpted object, but a film that creates a three-dimensional image. The film, made with laser beams and white light, produces an image that seems to float in space. Since it is a film technique, holography allows for movement of the image.

Although devices like the pantograph had been invented in the early 17th century to facilitate two-dimensional reproductions, James Watt, the father of the steam engine, was the first man to pursue this vision with regard to three-dimensional objects. Previously, if a sculptor wanted to reproduce his work, he could rely only on human means: by making a plaster cast of the sculpture or employing artisans who would transfer the measurements of the original to a marble block with calipers, then carve out the copy by hand. The carving and casting were rough and tedious jobs for both the artist and artisan, with whom Watt sympathized. So Watt invented two *machines* that would do the work instead.

He devised his first machine, a proportional sculp-

Michele Bogart is a predoctoral fellow at the National Collection of Fine Arts.

ture machine, which could be used to make smaller or larger copies, in about 1804. To make perfect reduced copies of sculpture, an operator pumped a treadle bar that moved a drive belt controlling a movable and pivoting arm. Attached to the pivoting bar were a tracer which touched the original sculpture and a cutting device that sliced into the copy. While pumping the treadle, the operator turned the original sculpture by hand so that the tracer could touch all parts of the original.

It was tough work and, unfortunately, the machine could not copy works of equal size or cut into hard substances such as marble. So Watt started seeking an improved carving machine. Apparently inspired by a French lathe that was used to copy medals, he started to tinker with his new machine in 1809. This was constructed along lines similar to the first. The difference was that instead of lying horizontally, the master sculpture and the copy stood on vertical centers, attached to tetrahedral frames that faced the operator. The two tetrahedral frames were connected so that the tracer and cutter moved vertically and horizontally to duplicate the entire original in the same size.

The device functioned as peculiarly as it looked and even Watt himself had difficulty in making it work. He also had difficulty in finding an appropriate name for his machine: Iconopoia, Iconurga, Iconoglypta, Algamatopoia, Glyptes, Polyglyptes, Bust-lathe, Statue-lathe and Double Parallel-lathe were just a few of his ultimately unsuccessful attempts.

Watt did, however, finally succeed in improving his machine, and by 1814 he had made copies of an Egyptian head and busts of Adam Smith, Sappho and John Locke. These sculpturing attempts were quite successful, and Watt's biographer, J. P. Muirhead, proudly noted that the works "displayed not only all the breadth and boldness of outline, but also the more intangible graces of animation and expression possessed by the models from which they were copied." Watt had been more modest about his triumphs, apologizing that all defects should be "pardoned as the imperfect work of so *young* an artist." He was then 78 years old.

His artistic contribution never reached the outside world during his lifetime. But a man unknown to Watt, John Hawkins, had produced a similar machine

Solid photography sequence begins, at left, with subject posing for

eight cameras. Light bands are traced on the surface; then

at approximately the same time as had Watt. Hawkins publicized his reducing machine several years after Watt's death. But it was Hawkins' colleague, Benjamin Cheverton, who saw potential profit in the business of making sculpture reproductions, and, in 1828, his new and simplified version of the sculpture reducing machine appeared on the market. A friend's correspondence indicates that the machine worked.

On Cheverton's machine, the sculptures were fixed on a verticular axis to the bed of the machine. The tracer and cutting tool were again attached to a shaft that could move in any direction to cut out the reduced version of the original sculpture. The reducer received great publicity, and the English porcelain industry used it extensively for making statuettes of Parian ware, a form of porcelain that bore a close resemblance to marble. The device was shown with great acclaim at the Great Exhibition in 1851. In 1859, the *Illustrated London News* announced the formation of a British Sculpture Working Association, whose purpose was to further improve the art by doing away with "tedious processes of pointing and roughing out," and by promising that "while by machinery it effects a great saving in time, it is far more correct than any hand can ever pretend to be."

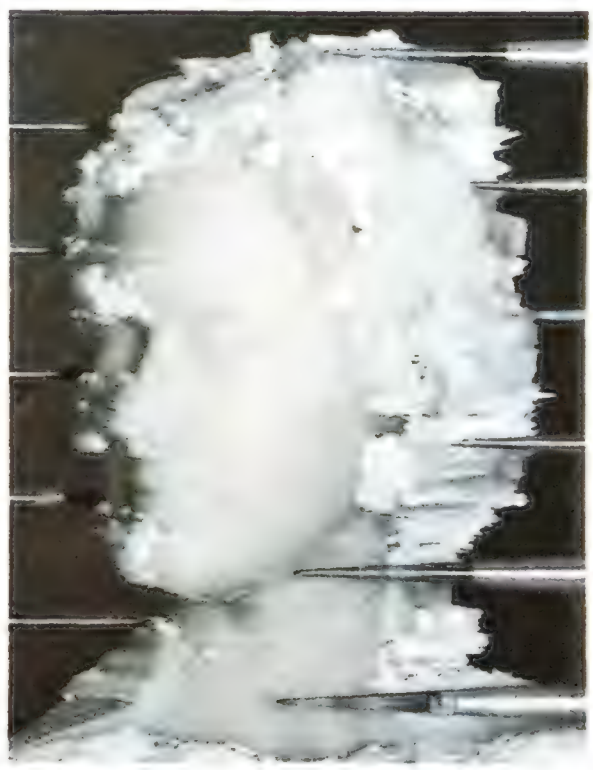
Meanwhile, in France, Achille Collas introduced his *réducteur mécanique*. Even the most prestigious and snobbish art critics were ecstatic. With the help of the Collas machine, the mechanization of reduced sculpture reproductions had finally been perfected. Now anyone could own a perfect copy of the *Venus de Milo*. There was even a choice of four sizes. And anyone and everyone was now a potential customer for domestic art objects in the new age of bourgeois interior decoration. A person's social class could no longer be immediately determined by whether or not he exhibited works of art in his home.

The next step was taken by Joel Tanner Hart, an aspiring Kentucky sculptor, who perfected a "miraculous" pointing machine (p.104). Like Watt's machines, Hart's device aided the artist in copying statuary into other media. But, in addition, Hart's machine surpassed all previous efforts because it allowed the artist to transfer "from the living form and features to the clay plaster," and thus provided the artist with a ready-made conception. No longer was it necessary for the artist to toil at creating an effective and accurate portrait that captured the sitter's essential personality and soul. Instead, the machine guaranteed a better likeness than any artist could ever hope to achieve with his "mere" eyes and hands.

Hart's own sculpting techniques already showed an obsession with accuracy. (When making his statue of Henry Clay, now in the State House at Richmond, Virginia, Hart took daguerreotypes of Clay from every angle as well as life casts from Clay's face and body. And apparently to no avail—one eminent critic termed the Clay statue the "meagerest effigy of them all.") His pointing machine demonstrated his passion for accuracy of measurement to the point of perversity.

The machine consisted of an iron shaft from which projected tubular frames with branches and with more than a hundred blunt needles attached. It was reminiscent to the sculptor Thomas Ball of "that inquisitorial

roughed wax sculpture waits for refinements. Above,



"fine-cut" machine smoothes details. Further finishing leads

to the completed patinated final portrait, with model.

Hologram, of prehistoric Smithsonian skull, *PUM III,* was made using white and laser light.

Hologram of the same skull used only laser light. Both films were produced by Polaroid.

instrument of torture called, I think, the 'Scavenger's Daughter.' " The machine *was* rather Byzantine.

The sitter was clamped into a mechanical chair that could be adjusted to any size body, "be he Daniel Lambert or the living skeleton." (Lambert, an Englishman known for his corpulence, weighed 739 pounds.) The "crown of thorns" was adjusted around the victim's head at a distance of four to five inches. Then each needle was adjusted so as to touch all protuberances and depressions of the sitter's face and body. The blunt needles were attached to screws that allowed the needles to be moved in or out until all of them touched the sitter's body. When all 180 needles encompassed the sitter's body, the device was sprung open and the prisoner released. What remained was a shell of needle points that evoked all undulations of the subject's physique "with mathematical precision." The "artist" then applied the machine to a lump of clay and modeled it out to the point of each needle, thus obtaining a clay duplicate of the living model. He then "completed" the model by smoothing and refining the features, "to seize the evanescent elixir of expression."

A short-lived enthusiasm

Critics were pleased with Hart's machine, especially in England, where he reportedly received commissions to "sculpt" ten leading citizens of London society. Journals like the *Illustrated London News* and the *Cosmopolitan Art Journal* praised the device as a labor- and time-saver for both artist and sitter. However, the enthusiasm was short-lived and the device was left to gather dust. Perhaps the very sight of the machine scared people off, for our only testimony is what Thomas Ball told us: "It was very ingenious; but no other mortal would ever make use of it, and he would never have used it had any other mortal invented it."

Hart's machine had an obvious drawback: it was difficult to obtain a suitable likeness, since the machine did not have enough needles to take complete measurements. Therefore, the artist ultimately was forced to rely on his own vision (the machine should have eliminated this needless labor).

Photo-sculpture offered a welcome solution to the measurement problem. First devised in 1860 by François Willème, and modified as machinery became more sophisticated, the photo-sculpture process survives to the present day. With Willème's invention, the subject stood on a platform in the center of a large, circular room, facing 24 hidden cameras, placed equidistant from each other and focused toward the center (p.104). Once the subject was properly posed, the operator snapped the pictures—all 24 of them—by stepping on a

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treadle that activated the opening of the shutters of all the cameras simultaneously. The subject matter was no longer needed. All that remained was to execute the sculptured "chef-d'oeuvre." (According to the poet Théophile Gautier, some persons naively believed that the miracles of science could even produce a finished photo-sculpture after this initial photographing phase.)

The photographs were then flashed sequentially onto the glass of a magic lantern. In front of the screen, an artisan worked with a lump of clay that was roughly divided into 24 parts (see p.105). Using a pantographic instrument, he traced each silhouette as it flashed onto the screen. The pattern was simultaneously cut into the clay, and the artist then revolved the clay block 1/24th of a circle, repeating the process for each photograph until he had traced all silhouettes into the clay. About all that was left to do was to smooth down a few rough edges. Critics viewed the creation as a *photographically* exact, three-dimensional portrait.

Photo-sculpture was immensely successful from 1861 to 1868. Studios blossomed in Paris, London and New York, and Gautier raved about the works that were the product of "no sculptor, and that the sun alone has a right to sign."

But the novelty was short-lived. After all, the labor involved in operating the machinery to produce a work of photo-sculpture was no less than that required for an original work. Even Willème's photo-sculpture studios went bankrupt and closed around 1868. Still, the process remained alive with H. G. Edmunds' techniques of 1921, continuing and modifying the photo-sculpture tradition and using more complex equipment and techniques but similar principles. For 50 years the Edmunds technique would represent the "state of the art."

But innovation springs eternal, and while it is not certain whether the search for a perfect mechanized likeness motivated those dedicated scientists who developed the computer and the hologram, it was inevitable that their techniques would eventually be pressed into "artistic" service. After all, from Watt's time on, visionaries had applied lathes and calipers and cameras to make faithful reproductions. Why not computers as well?

Why not indeed? was the response from the creators of the Studio for Solid Photography in New York City. For more than a year now, the Studio has advertised photo-sculptures that mirror "reality," not "conception." The work need not be created by an artist—or anyone else for that matter; it is the product of a computer and a carving machine. The work done by the solid photographers, with the special assistance of a computer, is a practical extension of Willème's and Edmunds' photo-sculpture. The subject poses for two seconds before eight cameras. Linear patterns of light are projected onto the subject's face and all three-dimensional information on the subject is coded by the camera (p.106-07). The coded film is then read by an optical scanner that converts the code into digital information to be processed by a computer.

The result of the processing is a roll of magnetic tape that contains accurate measurements of the subject or object. The computer analyzes this information, ascertains the three-dimensional form of the subject's head, then activates a "course replicator" device that carves wax. The rough model is then placed on a second "fine cut" replicating machine with 20 rotating blades that refines the work. A mold is created from the wax model and used to cast the final sculpture. Finally, if the client so desires, an artisan can vary the textures of the machine-work to produce a "masterpiece." Unlike earlier photo-sculpture processes, solid photography entails minimal human contact with the actual work of sculpture. The buyer may then order a sculpture in the medium of his or her choice: bronze, acrylic, pewter, ebony or plastic. The company has a studio that makes enlarged copies of very small objects and another studio that, like one of Watt's original machines, turns out much smaller versions of large objects.

There is, of course, a place for such marvels of science and technology in the modern world. And yet, the artist remains, doing his work by hand and spirit and, somehow, there is—and a good thing too—still a vast difference between the two.

Holography artist examines a piece of film. A hologram of Marcello Mastroianni is on screen.

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By Larry Engelmann

Rum-running gave Detroit dim view of prohibition years

High-speed runs by booze-laden boats were fun to see, but sober citizens insisted their river wasn't the Marne

In the mid-1920s, visitors on Belle Isle, off Detroit, were treated to an exciting, continuing spectacle as the newest breed of scofflaw, the rumrunner, endeavored to outguess, outwit, outflank, outmaneuver and outrun the forces of law and order patrolling the U.S. half of the Detroit River. The principal object of the "mosquito fleet" was to land liquor on the U.S. shore where the importation, transportation and production of alcoholic beverages were prohibited. The "prohibition navy" tried to stop the smuggling.

Picnickers and sightseers on Belle Isle watched gray patrol boats of the Customs Border Patrol and brightly painted craft of the Detroit Police Department conceal themselves from lookouts on the export docks and among the trees of the Ontario shoreline, or on Peche Island at the mouth of Lake St. Clair.

Occasionally a rowboat, loaded with tarpaulin-covered cases of whiskey consigned for delivery in Havana or the West Indies, drifted downstream, the rower relaxing at his oars in the nearly imperceptible current. Seemingly unconcerned about the distance to his legal destination, the rower became a watcher of the patrol boats, impatient with their persistence. Then, avoiding the paths of faster boats, he continued his circuitous route to the Caribbean, a destination that neither the distiller who produced his cargo, nor the Canadian customs agent who made out his bill of lading, nor the laborer who loaded his boat, nor the patrols on Belle Isle—nor, in fact, the rower himself—believed he would ever reach.

Engelmann's rum-running book will be published by The Free Press in June. He is writing a biography of Helen Wills.

A naughty lady of the '20s shows one way of smuggling booze. Perhaps that's Scotch "just off the boat" sloshing above her right knee, Old Red Eye over the left.

But the declaration of the distant destination was a necessary part of the charade. Yachts, also loaded with liquor and riding deep in the water, ploughed past the rower as they progressed downstream toward the narrowest section of the river. The picnickers on Belle Isle, meanwhile, savored the cool breezes.

Suddenly, the warning cry: "Here she comes!" Hundreds of heads snapped to scan the Canadian side of the river. A high-powered engine roared and a billow of spray unrolled, as a boat from Canada sped downriver and angled toward the Michigan shore. There was another roar, and yet another, as patrol boats leaped from their hiding places and raced in pursuit, armed officers in their bows grasping megaphones with which to order the heave to. Watchers were enthralled. Here was an unparalleled sporting event, pursuer and pursued going full throttle.

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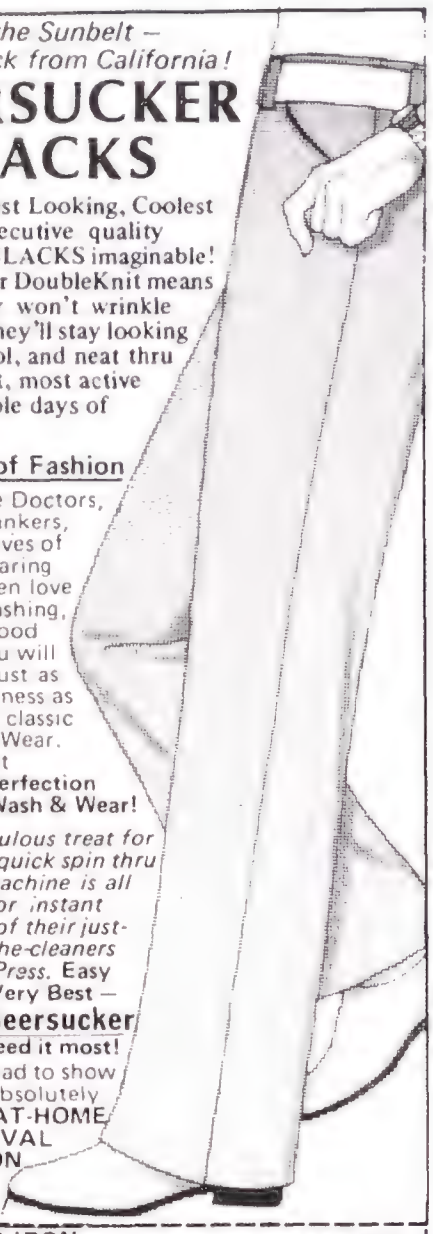

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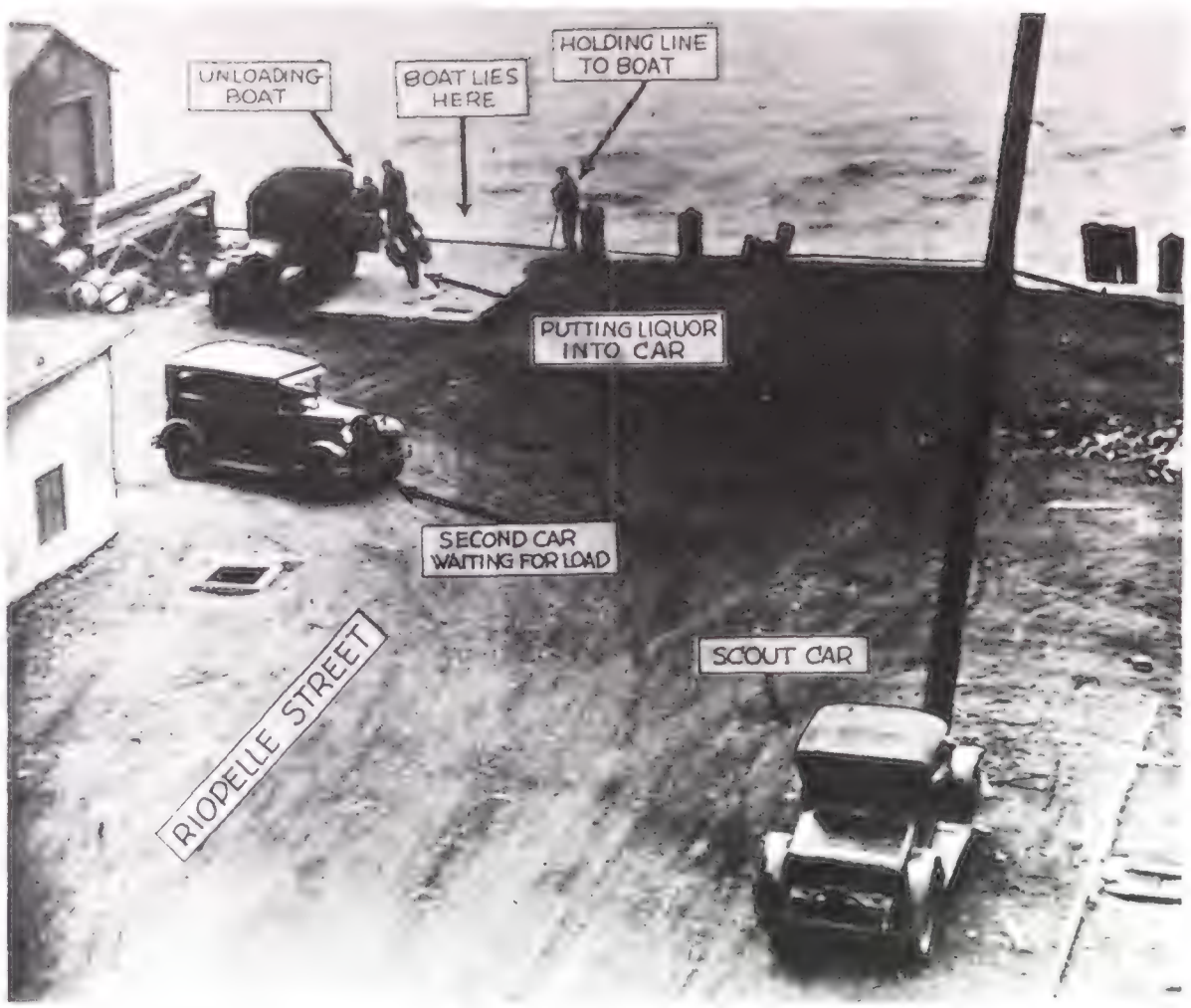

On Detroit's Riopelle Street, bootleggers unload liquor from boat (not seen here) in a photograph annotated in the mode of the day. Job took less than a minute.

The scenario ended in one of several ways. Sometimes, after leading the patrol craft several miles downstream, the suspect boat would gradually cut its speed and wait for its pursuers to pull alongside. They would then discover that it was merely a decoy to clear the river of police patrols in one section and make the area safe for crossing by other rumrunners. Or the rumrunner might suddenly put on speed, make a 90-degree turn and race for the sanctuary of Canadian waters with the patrol boats seeking the best angle for interception. Then, with a sudden dying of the engine, the smugglers would feverishly dump their cargo overboard, pieces of burlap and wood and Canadian export papers ringing the bobbing boat. Or yet again, the boats would race out of sight downriver with the rumrunner gradually leaving his pursuers behind.

As soon as previously hidden patrol boats committed themselves to a pursuit, rumrunners who had been awaiting just such an opportunity quickly advanced toward different points on the U.S. shore. And that rower bound for Havana now abruptly changed his mind and flailed away toward the United States.

At landing sites, cars and trucks were loaded, their contents then transferred to warehouses where it was "cut" (diluted) prior to distribution. Each rumrunner had his own preferred landing areas. Some used the private docks of wealthy families along the gold coast of Lake St. Clair. Others used brush-shielded riverbanks with no docking facilities along isolated country roads. Still others, incredibly, preferred to land their liquor in broad daylight only a few blocks from downtown Detroit.

In 1929 reporters for the *Detroit News* investigated reports that large quantities of liquor were being openly landed every day. Early one morning they drove to an alley near the foot of Riopelle Street and waited for rumrunners. Because the Customs Border Patrol headquarters was only four blocks away, the reporters doubted the accuracy of the rumors. They found the morning's proceedings nearly unbelievable (above).

Sheltered on the east by the Huron Portland Cement Company plant and on the west by the Detroit United Railway power station, the foot of Riopelle offered a haven. The reporters watched from a

PRODUCTIVITY IS LAGGING IN THE ROCKIES, BUT LOOKING UP.

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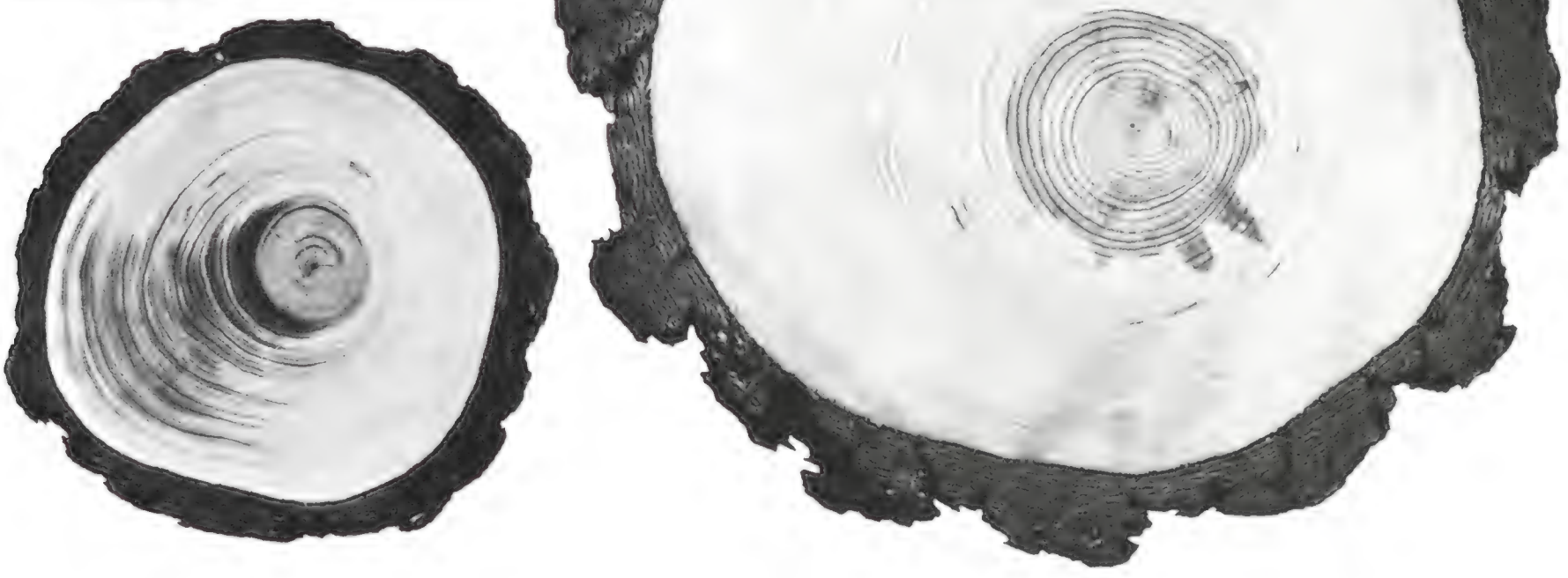

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Patrol boats prowl the Detroit River, passing under Ambassador Bridge . . .

. . . and a rumrunner hastily dumps his cargo. Perhaps his outboard quit.

distance on a Wednesday morning. At 9:15 A.M., a small car arrived at the dock carrying two armed men. This was the scout car. It turned and parked a short distance north of the landing site. At the same time a "traffic officer" in street clothes took up his post on the sidewalk at Riopelle and Atwater and awaited an all-clear signal. Within a few moments, two more cars arrived, turned on the Huron Cement Company pier and backed to the river's edge. A dozen men appeared from as many directions, as if by magic.

At 9:23 A.M. a boat appeared from the east and headed downstream past the foot of Riopelle. One of the waiting men crushed a small piece of paper in his hand and tossed it into the river. The boat turned quickly at a point opposite the foot of Rivard Street and shot alongside the pier. The waiting men seized bow and stern lines and pulled the boat close in. Two others dropped to the deck, opened a cuddy and passed up 20 sacks to the pier where they were lugged to the waiting cars. The unloading was accomplished in less than one minute.

The two automobiles, preceded by a scout car, then drove north on Riopelle to Atwater, where the "traffic officer" held up traffic until one car turned west and the other two east. All sped away to the plants for cutting and rebottling. The dock workers dropped from sight. They reappeared 20 minutes later to repeat the operation with another shipment.

Reporters who followed the adventures of rumrunners usually adopted the jargon of that trade for their stories. Lookouts and signal men were "airedales," dock workers were "monkeys." Guards and drivers were "gorillas," while boatmen were "rummies." A "puller" carried money across the river to pay for another cargo at the export docks. Each morning rummies received signals from airedales, crossed the river and transferred their cargo to monkeys who carried it to the cars of the gorillas.

Prohibition became the law in Michigan in 1916, but not until nearly two years later, when neighboring Ohio went dry, did the state's drinkers face the sober prospect of a world without much whiskey. As stores of remaining spirits in Michigan dwindled, gut-wrenching concoctions cooked up by amateurs in home stills and alley breweries appeared on the market. Drinkers without cast-iron stomachs prepared reluctantly to climb aboard the water wagon. In 1919 Congress passed wartime prohibition in July and a National Prohibition Act in October. Optimistic prohibitionists congratulated each other. A New Era was about to begin. Demon Rum was dead!

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"Here's lookin' atcha" is the title of this P. W. Cromwell cartoon.

This one, also printed in the *Detroit Times*, is called "Bottling up."

body suspected that Canada would provide a major challenge to American prohibition, and the expiration of wartime Dominion prohibition, in 1920, sent no political shock waves south of the Great Lakes. Control of the retail sale of alcoholic beverages was returned to the provinces; Ontario chose to be dry. Under the Canadian federal system, however, the manufacture, importation and exportation of liquor was controlled from Ottawa. And with the expiration of Dominion prohibition, breweries and distilleries, all holding charters from Ottawa, began once again legally to produce alcoholic beverages for interprovincial and international shipment and sale. In the Detroit area, where the river separating the liquor and the thirst was scarcely one mile wide, maps showed a dotted line representing the international border, running down the middle of the stream. U.S. Prohibition Commissioner Roy Haynes lamented that it was impossible to prevent liquor from dripping through a dotted line.

By early 1920, hundreds of Canadians and Americans were illegally transporting liquor across the Detroit River into the United States. Many of those first smugglers were jittery amateurs—"mom-and-pop" enterprises carried on usually at night. The London (Ontario) *Times* reported that Canadian and American entrepreneurs with secret caches of liquor waited in hiding among trees and tall grass on the Canadian side and were signaled when boats of smugglers passed. The boaters landed and bargained for the liquor. On clear evenings, as a Canadian customs boat cruised slowly down the river, the shoreline behind it came alive with signals from pocket torches and automobile headlights. One or two quick flashes might mean a small boat was starting across. A blue light flashed once and then twice quickly meant "all clear." A large sheet hung on a clothesline meant not that someone was drying bedding, but that police were in the area. When the sheet was taken down, the coast was clear. A frantically flashing red light meant "turn back immediately, police have arrived." Anyone with a diabolical sense of humor, a bed sheet and a lantern might have brought hours of confusion to the already jittery smugglers.

One smuggler (with a remarkably limited memory) recalled, "It was all common people. They weren't gangsters. The majority of the guys that were buying the whiskey were all people like us that would go out and buy, invest their money, to try to make a little bit on it. It was all common people and neighbors together and one neighbor would land at another neighbor's place and so forth. They never thought there was nothing criminal about it." Women participated as equals in the smuggling from the very start. "Everybody and his brothers and sisters and aunts" helped transport the liquor, a

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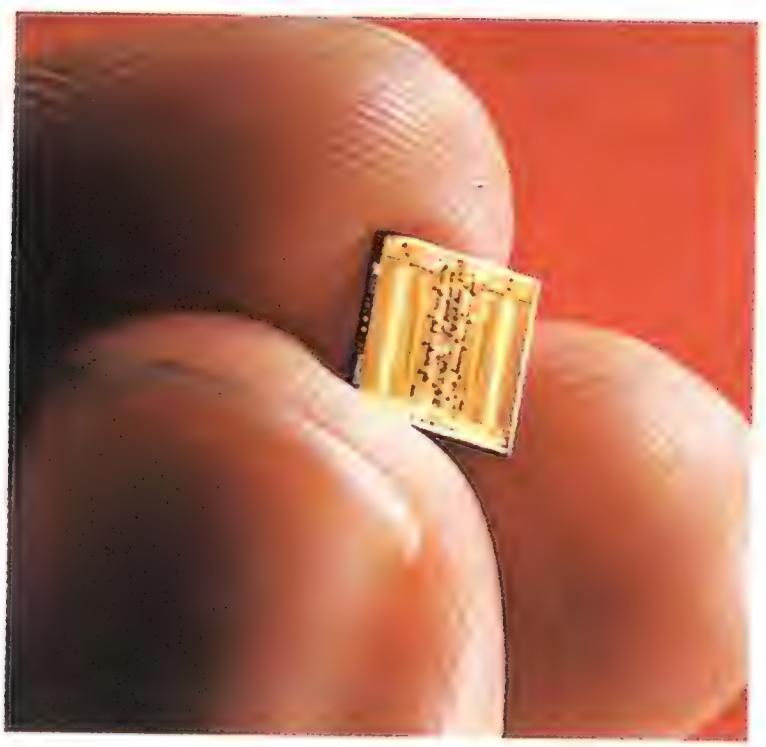

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smuggler remembered. "Anybody that had 14 dollars and his train fare to Montreal would go across the river and buy a case of whiskey."

Division of authority made federal agencies unable to provide leadership for a successful campaign against rum-running. Ill-trained, ill-equipped, disorganized and uncoordinated, the federal units in the Detroit area were victims of Congressional indifference and stinginess. Commanders from the prohibition navy complained periodically to Washington, but wet Congressmen were unsympathetic and dry Congressmen apparently feared that too large an appropriation for enforcement would be interpreted by the public to mean that prohibition was unpopular and ineffective.

Until the summer of 1929, boats used by the Customs Border Patrol had been seized from rumrunners. Federal forces on the river were not equipped with field glasses until 1926, or with handcuffs until 1927. Prior to the summer of 1928 the Border Patrol had no uniforms; inspectors had caps and badges only. Late in the Twenties a federal investigation into the Border Patrol revealed that although the quota for Detroit was 42 men, only 24 were in the service.

The task of the prohibition navy was made increasingly frustrating as rumrunners experimented with more bizarre methods of smuggling. As early as the summer of 1920, several army pilots stationed at Selfridge Field, Michigan, were reported to be flying in liquor from Canada. Easy profits explained the enthusiasm of many pilots for maneuvers in Ontario.

Bootleggers skid across the frozen river, doors open for escape if the ice fails.

One neatly improbable way to smuggle was by hearse, as two agents demonstrate.

There were disadvantages. Flying was done in the daytime, since night flying was still dangerous. Lacking navigation aids, planes on long flights could go astray and be detected by the police. Also, airplanes were still a novelty and people reported seeing them come down. No regular landing place could be used for long without the police tracking it down. Above all, cargo capacity was limited, as was the number of flights a plane could make each day. Crossing the river by boat took only a few minutes. An airplane, carrying a much smaller load, took several hours to get its cargo and deposit it.

Stories of electrically guided liquor-filled torpedoes swishing back and forth beneath the riverbed haunted the imagination of enforcement authorities and inquisitive reporters. No convincing evidence of the torpedoes was ever found, but one account of a pipeline did receive widespread notoriety.

It is said that a prominent (but unnamed) Detroit yachtsman, shortly before his death, recalled that when he had worked as an agent for a plumbing firm in the mid-1920s, he had been approached by a man who ordered a pump that could send liquor 2,000 feet through a two-inch pipeline. The buyer refused help in its installation. But he returned to complain that he could not make the pump work and to request the help of an expert. The expert and the sales agent accompanied the man across the river and downstream on the Canadian side to a small shack in a field. A freshly dug trench ran from the shack to the river. Getting to work, the expert removed a plug from the air cham-

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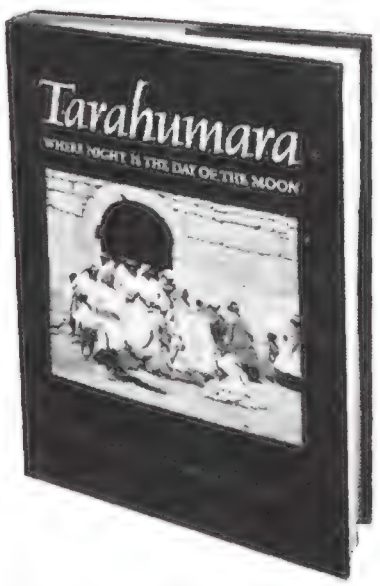

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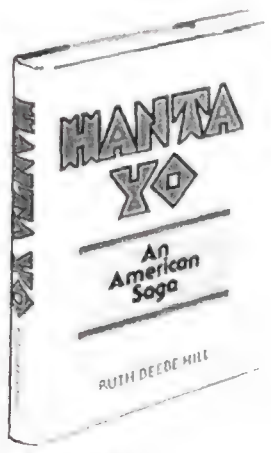

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Rumrunner on Canadian shore awaits the all-clear signal from the States. His boat, tucked behind a clump of pilings, is hidden from midstream patrols.

ber of the apparatus, and whiskey spurted out and sprayed the three men, literally flooding the room. After a few minutes the pump was working and the agent and the expert were taken back to Detroit.

At both ends of the Detroit River cases of liquor were pulled along the river bottom on sleds with long cables. One account mentioned a diver guiding a sled. In the fall of 1929, Customs Border Patrol inspectors discovered an apparatus by which 15 to 20 gallons of liquor could be hauled underwater to a point on the American shore.

During relatively brief spells of very cold weather, parts of Lake St. Clair, the St. Clair River, the Detroit River and northern Lake Erie freeze. It is then possible to drive from Canada to the United States. In January and February of 1925 and 1926, and again in January, February and March 1930, iceboats, sleds and cars from Canada crossed the ice constantly. Cars on the U.S. shore lined up at night and turned on their headlights to light the way. On Lake Erie, rumrunners in long convoys drove across the wide stretch of ice at the foot of the Detroit River. This was the most dangerous section because of thin ice and close proximity to a state police station.

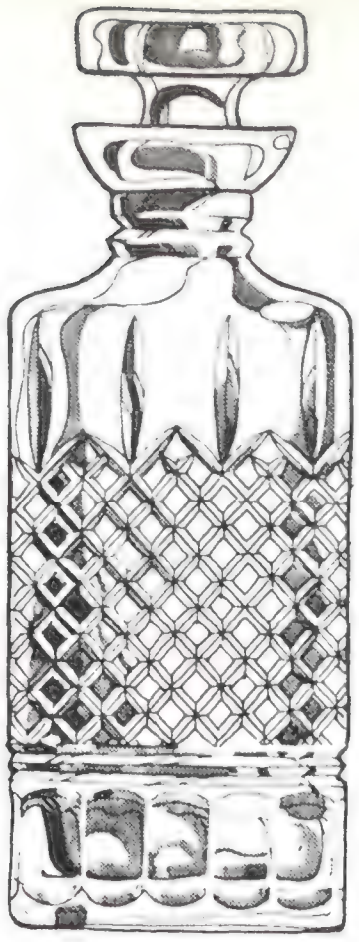
Night crossings were dangerous because of fishing holes and spots of thin ice. A driver came upon such spots, the ice would suddenly moan and sag, and the driver would race desperately for his life. Only speed saved the car.

Iceboats were lighter, faster and safer on thin ice. With a good breeze, iceboats were "phantoms to their pursuers," the state police complained. "A ring of steel clad runners, a ghostly flash of bellying sail and they are gone." The boats sped almost silently across the slick ice of Lake St. Clair in 12 minutes, and simply could not be touched by enforcement officers. State police used automobiles with tire chains to pursue them, but the fastest patrol car was slow compared to an iceboat. "Get near the ice boat and there is a sudden tack, perhaps near enough to send an auto skidding for many feet, and the phantom rum smuggler is hundreds of feet away." The police tried ambushing them, but the boats could quickly reverse direction and in the wink of an eye be far downriver, leaving the officers waiting for a less mobile rumrunner.

Rumrunners nailed ski runners to boats and pushed them across the river or towed several behind a car. When police approached, the boats were simply cut loose and abandoned in the middle of the river. Federal agents were equipped with "ice creepers," spiked attachments on their shoes to prevent slipping. But running with creepers was difficult and progress, while safe, was slow. Some rumrunners consequently donned skates and gracefully escaped the clutches of the creeping cops.

Violence was all too common in the enforcement of prohibition on the river. Even when rum-running was temporarily

Brandy (Questa Pattern)



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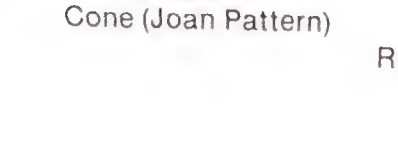

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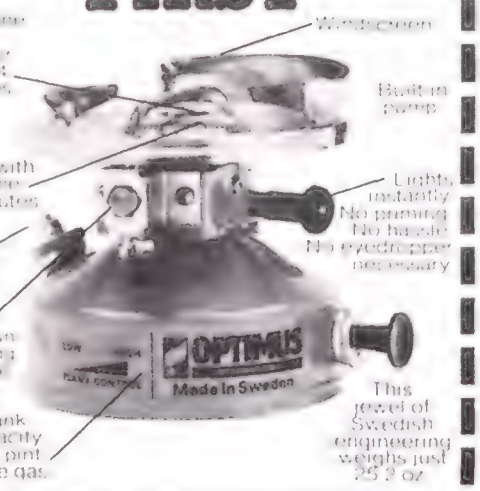

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interrupted, assaults on suspected rum-runners, careless gunfire (brought under control only when the Prohibition Bureau was brought into the Department of Justice) and rough handling of the public led many citizens to conclude that if such actions were really necessary to prevent drinking, then perhaps it was best to do away with the law rather than with the drinking. Granted, professional rumrunners seldom hesitated to shoot at patrol boats that closed on them. On the other hand, some rumrunners did not carry firearms. When enforcement officers warned that a virtual state of war existed on the river and referred to the area as "the Detroit Front," what citizen could accept such an analogy? The Detroit River was surely not the Marne!

A well-publicized accident in 1925 involved federal prohibition agents firing repeatedly at a launch carrying the two sons of Charles F. Fisher, vice president of the Fisher Body Company. The *Detroit News* reported that the boys were out for a ride, and when men aboard a patrol boat waved, they said they thought it was a greeting. The federal officers said it was a signal to stop. They pursued the Fisher boat and started shooting. Several bullets were fired, some nearly hitting the boys and one passing through the hull.

By far the most outrageous incident on the river during prohibition years involved James Lee and his 11-year-old daughter, pleasure-boating on the river along with several dozen other boats. It is easy to understand how Lee's craft might cross the path of a patrol vessel in pursuit

Feds in fedoras inspect largest illegal
distillery ever found in Detroit.

of a rumrunner. Witnesses asserted that the federal boat deliberately rammed Lee's. Both Lee and his daughter were killed: the little girl, knocked overboard, became entangled in the propeller of the federal boat. The patrol boat backed away from the sinking Lee craft and sped off without even offering aid.

The enforcement branch that suffered most from incompetence and corruption was the Border Patrol. Political manipulation and lack of support from Washington was demoralizing. Pay was very low and some quit in disgust and went to work for better pay for rumrunners. Some stayed in the patrol but worked secretly for the rumrunners. Some honest agents were hounded from the service.

Soon after taking office, President Herbert Hoover decided to terminate rumrunning from Canada once and for all. A massive enforcement drive on the Detroit River sent agents from all parts of the country to the area. Coast Guard cutters appeared on the river and the Border Patrol was augmented by an additional 154 men.

The drive was accompanied by diplomatic maneuverings, and eventually the Canadians barred U.S. clearings of all liquor-carrying boats. Canadian cooperation meant that flush times for rumrunners were gone. Only the bravest and most ruthless would dare cross the river between the two fires of Canadian and U.S. police authorities. In late June 1930, the federal government reported that at last the Detroit River was completely free of rum-running.

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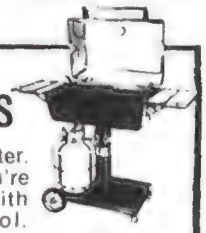

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Book Reviews

The Dance, Art and Ritual of Africa
Photographs by Michel Huet.
Introduction by Jean Laude. Text by Jean-Louis Paudrat.
(Pantheon Books, $35)

African objets d'art have long found their way into the museums and private collections of Europe. Carved ivory musical instruments, originating on the Guinea coast, entered Europe at the end of the Renaissance. Illustrations and written accounts by travelers of African dances and rituals provided some insights into the social and ceremonial context of such items. Ironically, increased exposure

Dance of the elephant masks on the Guinea coast

How to buy a personal computer.

In California, a store owner charts sales on his Apple Computer. On weekends though, he totes Apple home to help plan family finances with his wife. And for the kids to explore the new world of personal computers.

A hobbyist in Michigan starts a local Apple Computer Club, to challenge other members to computer games of skill and to trade programs.

Innovative folks everywhere have discovered that the era of the personal computer has already begun—with Apple.

Educators and students use Apple in the classroom. Businessmen trust Apple with the books. Parents are making Apple the newest family pastime. And kids of all ages are finding how much fun computers can be, and have no time for TV once they've discovered Apple.

Visit your local computer store

The excitement starts in your local computer store. It's a friendly place, owned by one of your neighbors. He'll show you exactly what you can use a personal computer for.

What to look for

Your local computer store has several different brands to show you. So the salesman can recommend the one that best meets your needs. Chances are, it will be an Apple Computer. Apple is the one you can program yourself. So there's no limit to the things you can do. Most important, Apple's the one with more expansion capability. That means a lot. Because the more you use your Apple, the more uses you'll discover. So your best bet is a personal computer that can grow with you as your skill and involvement grow. Apple's the one.

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to African art did not create heightened awareness and appreciation in the West. Grounded in the dualism of Western thought, and sustained by the sociopolitical consequences of the enslavement of Africans during the expansion of the economy of the United States, a fundamental ambivalence toward Africans, their art and dance emerged—at once a fascination and, perhaps, fear.

At the beginning of the 20th century, African sculptures and masks were imported to Europe in increasing numbers. These served as sources of contemplation and inspiration for both artists and the general public. Wrenched from the social and ritual milieu in which they were created, the masks became static representations of vibrant and meaningful events. Recently, there has been an increasing concern with the context of these art objects on the part of Westerners, so that the societies and rituals from which the artifacts were drawn are now regarded as integral aspects of the artistic experience itself.

It is this concern with the context that informs the work of French photographer Michel Huet, who has devoted himself to capturing the essence of African life since World War II. Evidence of his skill as a photographer and recorder of the human experience abounds in the more than 250 beautiful photographs taken among 40 societies from the Guinea coast, western Sudan and Equatorial Africa.

While reading the book, it is difficult to avoid involvement in the scenes depicted; the images are alive with people, their homes and fields, and the African landscape in which they reside. Many of the photographs are arranged sequentially, giving the reader a feeling for the ritual as a process, rather than a single, static event. The vigor and fluidity of the dance is captured by Huet, making the book a vivid document of the social and ritual milieu of African art. Since some of these rituals are no longer observed, the book becomes a valuable and poignant historical document.

The volume should be valued for more than its photographic content. An introduction by art historian Jean Laude offers a concise and informative treatment of African art history and an analytical framework for the appreciation of art as mediator between the natural and social environments. Jean-Louis Paudrat's text is informative and readable. Its placement at the beginnings of the chapters offers the pleasing opportunity to view the plates without distraction. The bibliographic references provide an introduction to French ethnographic and art historical literature on the subject. Thus, both visual and written aspects serve to enlighten and reward the reader.

—John J. Curry
Department of Anthropology,
University of Massachusetts, Amherst

An American Original:
The Life of J. Frank Dobie
Lon Tinkle
(Little, Brown, $10)
"Speak, Mr. Speaker"
Compiled and edited by H. G. Dulaney and Edward Hake Phillips with chapter introductions by MacPhelan Reese
(Sam Rayburn Foundation, Bonham, Texas, $12.50)

James Frank Dobie (1888-1964), ranch-style man of letters, and Samuel Taliaferro Rayburn (1882-1961), farm-style lawmaker, were proud of their Southwestern heritage and reflected it proudly, each in his own notable way. Dobie was paying a high compliment when he wrote on the flyleaf of a copy of his book, *The Longhorns*, presented to Rayburn: "You are just about the purest blooded Texas Longhorn left."

Lon Tinkle, veteran book critic and Southern Methodist University professor, has produced a full-scale, full-flavored biography of his friend Frank Dobie. Into this account of a colorful life he has woven his own recollections and prodigious research (involving formal records and casual notations and the fascinating panorama of the Southwest which is represented in the extensive Dobie canon) as well as interviews with relatives, friends, associates and detractors.

The early years are traced from boyhood on a South Texas brush-country ranch to studies at a small Methodist college and at Columbia University. Then the author picks up one of the main strands of Dobie's life—his love-hate relationship with the University of Texas, where he taught, with side sallies to military service, to other campuses (in Stillwater, Oklahoma, and Cambridge, England), to lecture platforms and to ranches, from 1914 until the late 1940s. At the university he refused to conform to the scholarly pattern of obtaining a

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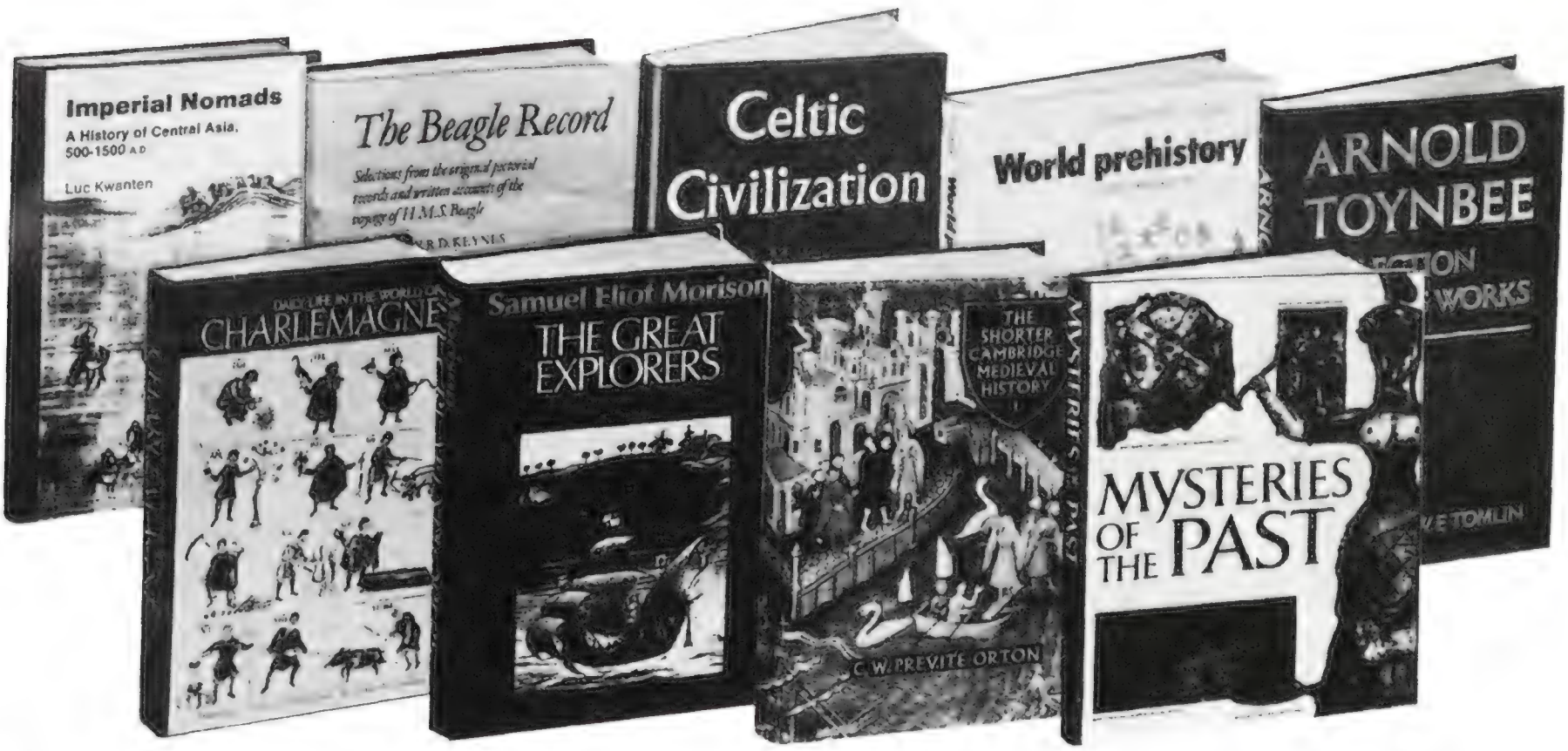

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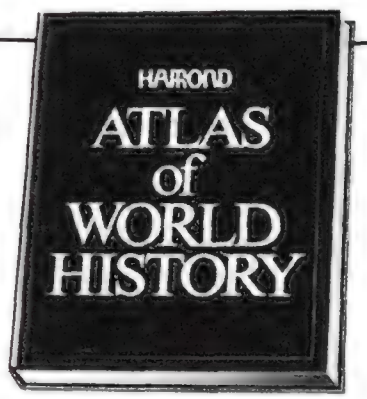

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PhD degree, advocated reading about mesquite trees and coyotes instead of daffodils and nightingales (and based his famous course on life and literature of the Southwest on such premises), and finally was fired by conservative regents who objected to his lengthy sabbaticals.

He recognized his ambivalence about academic versus practical life, saying "while I am in one world it is forever my fate to hear the music of the other: in the university I am a wild man; in the wilds I am a scholar and a poet." During all of this time Dobie was writing the books which made him an institution, a teller of tales about coyotes, mustangs, longhorns, vaqueros and fortune hunters.

Tinkle also describes the tenderness and strength of Dobie's marriage to a sensitive woman of delicate constitution. He tells of Dobie's capacity for friendship. He reports the evolution of Dobie's preoccupation with the past into a time of emphasis on present and future, and quotes this observation: "About the time World War II arrived, I was, without being conscious of the fact, becoming my own contemporary."

The Sam Rayburn book, like the man, is of quite different texture. This is not a biography but is valuable source material for one. It is a compilation—almost a scrapbook, following essentially chronological form. The 489-page volume was put together over a five-year period at the library of the Sam Rayburn Foundation, Bonham, Texas, by three men associated with the institution: H. G. Dulaney, compiler of the book and director of the library; Edward Hake Phillips, editor and foundation trustee; and MacPhelan Reese, writer of introductions to the chapters, who is a library staff member. The book presents quotations by and about Rayburn from such sources as speeches, letters, transcripts of interviews, newspaper and magazine articles, and various records and documents.

The format is unusual. Every chapter begins with an introduction which addresses Rayburn, mentions certain events of the period covered, and then invites him to "Speak, Mr. Speaker." A majority of the quotations are carefully identified as to whether they occur in letters, speeches or other places, and are dated. The exception is that almost every page displays quotations which are indented but are not described or dated; only a blanket explanation is offered.

This impressive book could have been improved in at least two respects. Although it is sufficient to mention that a certain interchange occurred between Rayburn and Harry S. Truman, there are many obscure names mentioned without identification. Secondly, the typography does not quite do justice to the material. But this is a book that invites repeated browsing. It gives many glimpses into the mind and personality of a man who served in the Texas legislature and then went on to almost half a century in the U.S. House of Representatives, including terms as Speaker of the House at both state (1911-1912) and federal (1940-1946, 1949-1953 and 1955-1961) levels. Mr. Speaker does indeed speak his mind on many topics.

Frank Dobie and Sam Rayburn—rugged individualists both—deserve the renewed attention these new books will focus on them.

—Earl B. Braly
Former professor of English
at Texas Tech University

American Given Names
George R. Stewart
(Oxford University Press, $12.95)

If you are just another "junior" in a line of Edwins, or if you were named after a maiden aunt who ignored you in her will, it wouldn't be unreasonable of you to hold against Shakespeare that line about a rose by any other name. And while the National Science Foundation has yet to fund a systematic study of why people named Homer have friends named Bill, most of us wish our parents hadn't been so quick to have our birth certificates completed and filed.

A name, after all, is something that most of us have to live with and maybe name our children after. George R. Stewart's *American Given Names* is a dictionary of more than 800 names capable of returning a certain etymological and philological pride to every Tom, Dick and Harry. Like other works on given names, Stewart gives the origin and meaning of each one listed. Unlike these other compendiums, Stewart's is replete with the names' oral and written traditions. These capsule histories return a particular distinction to each name that daily usage has obscured, making Joe, for example, more than the insignificant diminutive of Joseph.

Stewart, who is remembered for his classic *Names on the Land,* is impassioned with the substantive. Like the archaeologist dealing with the artifact, Stewart handles each epithet for its record and its texture. He has turned a rather academic interest into a popular subject, and his love of language is infectious. The historic and linguistic research and the wit in *American Given Names* reward the scholar and the browser. The care in this book makes the appendix in Webster's insufficient for every John checking to make sure that his name is still the Hebraic translation for "God-is-gracious."

Names are, of course, subject to the same cultural and linguistic shifts as is all language. The vernacular and geography affect the popularity of any given name at any given time. Stewart traces these influences from the given name's Indo-European antecedents through its standing on the 1975 Princeton roster, perhaps an idiosyncratic choice.

From the Saxon tradition to the anti-traditional 1960s, each culture has made name-calling richer. The Saxon kings left us with Edith and Alfred. And when the Norman Conquest was a fait accompli, Richard and Henry were as at home in the courtyard as in the stockyard. John wasn't made a household word until the Crusaders brought it back among their other Eastern spoils. Up until the Reformation, the naming pool was primarily non-Biblical. Luther unwittingly made the New Testament a popular resource for fallen-away Catholics.

While some names are staunch perennials, others are cyclic. Parental taste is attributable to trends, eccentricities and character building. It's still hard to be a boy named Sue.

Sociological trends have done more than pass on or adapt a particular name. The early German immigrants to America toward the end of the 17th century introduced the middle name. It was taken to immediately and, by World War I, American servicemen's records listed "NMI" (no middle initial) if they didn't have one. Some names have lost their historical implications. Michael is no longer considered just a Biblical name; it is now thought to be a safe, secular choice.

From Aaron to Zuriel, *American Given Names* discusses an alphabetical catalog that has found its way into our culture by tradition and steerage. This book exhumes as well as explores the obscure

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and the ordinary. Stewart is historically more inclined toward those who sailed into Plymouth rather than into Ellis Island. But a definitive collection of American given names would probably be the lifework of a committee of thousands. Any dictionary of names, however, that includes Mahershalalhashbaz will probably include the reader's own, a first stop to be sure, which will certainly tempt you to read the rest of Stewart.

—Carollyn James
Free-lance writer

The Plains Across: The Overland Emigrants and the Trans-Mississippi West, 1840-60
John D. Unruh jr.
(University of Illinois Press, $22.50)

Correcting Hollywood myths and realizing the paucity of solid, broad scholarship on the movement West before the Civil War, historian John D. Unruh jr. has written *The Plains Across*. Begun as a doctoral dissertation, his splendid book represents ten years of research and writing and now appears posthumously. Unruh died three years ago at the age of 38.

Drawing on innumerable letters, diaries and other works by the emigrants who traveled the Oregon-California Trail, Unruh brings Americans' westward migration to life: for instance, we hear pioneer Franklin Langworthy complaining, in 1850, that "the road, from morning till night, is crowded like Pearl Streat [sic] or Broadway," Finley McDiarmid observing that the Snake Indians are "very sharp traders not easily cheated," and the views of countless others. But Unruh does far more than simply re-create the two decades of trail life that brought about 250,000 people to the West Coast; he shows that the overlanders interacted considerably among themselves and with others—the army, the Indians, the Mormons and the traders—in ways overlooked in the past.

After surveying previous work on the period (from scholarly studies to A. B. Guthrie's "exceptional" novel *The Way West* to "superficial" textbooks), Unruh examines the factors that affected the westward journey. There was the climate of opinion. Not long after 1840 when Joel Walker brought his family to Oregon and became the first avowed overland emigrant, the nation's newspapers began publishing conflicting accounts about the trip across the "Great American Desert," as the West was then known.

The West was "a frightful monster," said one New York paper. While "fanciful and overdrawn" reports of starvation and Indian raids stirred fears, the same papers were filled with optimistic letters from successful overlanders. The journey had been "merry as a marriage bell," said one such writer.

The author shows that those with the courage to disregard published warnings proceeded to Independence, St. Joseph, and other Missouri River frontier towns, where they commenced a journey marked by a high degree of cooperation with their fellow pioneers. Their wagon trains were not widely scattered, as popular myth would have it; rather, the overlanders moved in large groups (with teams even 12 abreast at times), created an elaborate "roadside telegraph" of messages left on trees, posted warnings about water and grass conditions, and frequently helped one another on the trail. Physicians, in particular, worked hard, and often for free.

Perhaps most fascinating is Unruh's discussion of the Indians, who not only ran toll bridges and demanded tribute but also gave the pioneers route advice, served as guides and helped at dangerous river crossings. Unruh finds that Indian attacks were often "greatly exaggerated" in later recountings—many were actually conducted by renegade whites done up in war paint. Thievery, not massacre, was in fact the most common Indian threat.

As the westward migration progressed, emigrants received more and more aid in making the journey. Forts Kearny, Laramie, Drum and others soon dotted the trail, and government programs of exploration, surveying and road building were initiated. Mountain men and others offered ferry and guide services. And the people of the West Coast established relief programs and built roads to ease the final miles when men and supplies often neared exhaustion. Because these efforts were generally uncoordinated and sporadic, there was no typical year on the trail, says Unruh. The trip was "unique" to each traveler. Quite often, the pioneer's health and sheer luck made all the difference.

The author notes, however, that the collective experience of overland travel did have a "nationalizing, democratizing quality." He points to a letter in which David Dewolf, traveling with people from Mississippi, Tennessee, Illinois and Ohio, writes that "we are a mixed up multitude but we all get along fine. Some of them get in a spur now & then but soon get over it. This trip binds us together like a band of brothers."

Such telling letters are abundant in *The Plains Across*—an intelligent, insightful and well-illustrated book that gives us a new understanding of the pioneer movement westward.

—Joseph Barbato
Writer and critic

Strain of overland travel is reflected in faces of this migrating Mormon family.

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Language Translator *(Continued from page 33.)*

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200 Years of American Graphic Art by Clarence Hornung, Braziller, 1976

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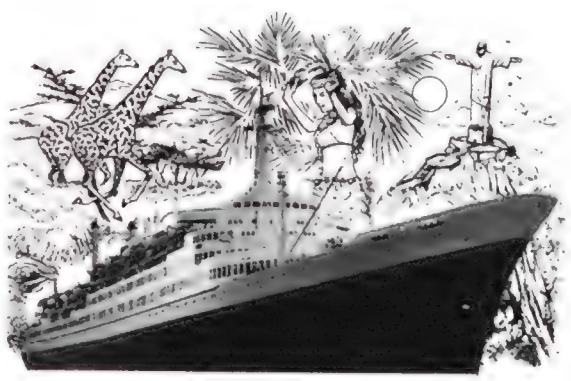

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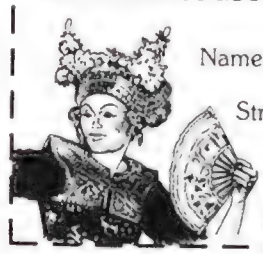

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Domestic Study Tours

Connecticut Antiques—June 17-24: Visit museums, special collections, historic houses, private homes and noted dealers.

Family Folk School—July 1-7: Serenity of western North Carolina mountains provides the best environment for instruction in woodcarving, pottery, off-loom weaving, blacksmithing, copper enameling, lapidary work. Also field trips, Appalachian history, traditional folk dance and music.

Montreal/Quebec—July 7-15: The development of French culture in North America; enjoy museum visits and walking tours.

White Water in Utah—July 22-August 1, September 30-October 10, or October 11-21: Explore geology, wildlife and colorful history of Green River.

Colorado Peaks—July 28-August 5: Alpine basin near Continental Divide provides base for camping and hiking.

Alaska—July 29-August 7: Wilderness retreat at Camp Denali introduces natural wonders of Mt. McKinley Park.

Grand Canyon—August 17-27 or August 24-September 3: Raft trip with emphasis on ecology, natural history—and excitement.

Nova Scotia—September 1-10: Trace the rich history and varied cultures of this ruggedly beautiful Maritime Province.

Folk Dance and Music—September 4-9: Join nationally known staff for program of British and American folk dancing, song at a camp near Buzzard's Bay, Massachusetts. Choose from variety of contras, quadrilles, regional and country dances, sea chanties, pub songs, gospel tunes; classes supplemented by seminars on folk traditions, concerts by guest performers.

Bryce and Zion—September 13-21: Study the geology and natural history of Utah's spectacular national parks.

Toronto—September 18-24: The city's art and architecture; and visits to the Stratford Shakespeare Festival and Niagara Falls.

California Wine Country—September 30-October 5: Visit selected vineyards for tastings, lectures and discussions with distinguished wine masters.

Archaeological Dig—October 6-13: Join archaeologists in an actual dig, supplemented by instruction, lectures, laboratory work and field trips in Illinois.

Asheville, North Carolina—October 19-22: Visit Biltmore, famous Vanderbilt estate, Thomas Wolfe's house and other historic homes in this mountain resort area during peak of fall foliage.

Florida Keys—October 28-November 4: Active program offers snorkeling and field trips to study marine ecology.

Washington "Anytime" Weekend: Choose any weekend to visit original Smithsonian building, spend two nights at Loew's L'Enfant Plaza hotel or the Hyatt Regency, both close to the Mall, and see other sights in city by Tourmobile. Reservations and payments must be received by the Smithsonian Institution at least ten days prior to arrival.

Foreign Study Tours

Nile Cruise—November 19-December 8: Fly to London and visit British Museum's Egyptian Collection with staff members before continuing on to Cairo. Spend two weeks aboard the M.S. *Delta* cruising up the Nile from Cairo to Aswan, enjoying scenes of daily life along riverbanks and visits to Sakkara, Memphis, El Amarna, Abydos, Dendera, Karnak, Luxor, Valley of the Kings, Edfu, Esna and Kom Ombo. Optional flight to Abu Simbel before returning to States.

Copenhagen to Lisbon—August 17-September 3: Cruise on MTS *Argonaut;* transit the Kiel and North Sea canals; sail up the Seine, Loire, Gironde rivers, with special visits to northern Spain and Portugal.

Foreign Charter Tours

Lapland and Coastal Norway*—June 19-July 5: Celebrate summer solstice; journey through "top of Europe" for unique contrasts of village, forest, moor and mountain; cruise fjords of Norway to North Cape; visit modern cities of Rovaniemi, Tromso and Helsinki.

Scotland*—September 9-23: Enjoy walking tours, visits to castles, abbeys, battlefields and archaeological sites.

Oxford/Smithsonian Seminar—September 14-29: Lectures, field trips and special seminars conducted by Oxford University utilize rich resources of the town and celebrated institution.

Sultans' Treasures*—September 23-October 7: Five-day program in Istanbul followed by one of four excursions to Aegean Turkey or Anatolia and Cappadocia; trip ends in Ankara, Turkey's modern capital.

Spain*—September 30-October 14: Enjoy cosmopolitan Madrid, historic sites in New Castile and one of three travel seminars to Santiago, Barcelona or Andalusia.

Japan—October 21-November 6: Extended program in historic Kyoto and Nara followed by choice of travel to Inland Sea or Sea of Japan; trip, which originates and ends in San Francisco, climaxes in Tokyo with visits to Nikko or Kamakura.

Guatemala—October 31-November 11, November 21-December 2, January 23-February 3, or February 20-March 2: In the company of an archaeologist, visit Tikal, monumental Mayan city of Petén jungle; Copán, Mayan site deep in Honduras; plus Mayan ruins of Quiriguá, El Baúl, Democracia (tour originates in Guatemala City).

Mayan Mexico: The Yucatán Peninsula—November 11-23, December 5-17, January 8-20; or February 5-17: A complete tour of the extraordinary Mayan ruins of the Yucatán (tour originates in Mérida).

New Zealand and Fiji—November 21-December 9: Tour includes Mt. Cook, Te Anau and Milford Sound, plus Auckland, Rotorua, Wellington and Christchurch; also talks on natural history, the Maori heritage, parliament and home visit.

Low-cost tours include first-class hotels, most meals, sightseeing, lectures, theater tickets, air fare. *Indicates optional predeparture course will be available.

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in Washington

Selected Studies Seminars

Come enjoy a popular new low-cost program at the Smithsonian featuring outstanding speakers, unparalleled museums and collections. Choose from these unique opportunities combining well-illustrated lectures and small, specially arranged field trips to get "behind-the-scenes":

Man's Quest for Wings—Sept. 30-Oct. 5: Experts at the National Air and Space Museum highlight achievements and triumphs in the wondrous history of flight. Includes a day's visit at the renowned preservation, restoration and storage facility at Silver Hill to view the finest and most varied collection of airplanes, spacecraft and memorabilia in the world.

Historic House Preservation—Nov. 4-9: Preservation authorities share their special "know-how" to help with the challenges of restoration. Participants visit numerous projects successfully completed and underway, including lovely urban houses and country estates.

Aircraft Restoration: How To—Sept. 9-13: Internationally known craftsmen of Silver Hill, who have re-created many masterpieces of aviation in the preeminent National Air and Space Museum, offer workshops on the many various techniques used.

Genealogical Research—Sept. 30-Oct. 5: (Repeat of popular program).

American Antique Furniture—Oct. 14-19: Dealing with the appreciation of antiques, 1650-1840.

Arts of Imperial Russia—Oct. 24-28: Visits to Hillwood Museum and the special exhibition at the Smithsonian of paintings from major Soviet museums.

China: A Cultural History—Oct. 28-Nov. 2: Prehistory to the enigmas of today, with emphasis on intellectual and artistic traditions and the great philosophies and religions. Includes recent films and tours of the outstanding collection of the Freer Gallery of Art.

Please send requests for full information on content, accommodations and fees by seminar title to Selected Studies, A & I 1190A, Smithsonian Institution, Washington, D.C. 20560 or telephone (202) 381-6434 for details.

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Smithsonian highlights for this summer

In visiting the Smithsonian for the first time, especially with children and teenagers in tow, perhaps one shouldn't be too dazzled by the general view but should concentrate on some particulars. At the huge Air and Space Museum, you can zero in on the 1903 Wright Flyer, the *Spirit of St. Louis,* a model of the *Star Trek* spaceship *Enterprise,* and the moon rock, which everyone can touch. Then, a few Frisbee throws away, at the Museum of Natural History, put on your list the world's biggest elephant, the Hope Diamond, the woolly mammoth, the Pum II mummy and the 18th-century Philadelphia gentleman whose remains turned into a form of soap.

Nearby, at the Museum of History and Technology, look for Washington's tent, Ford's Model T, Jackie's inaugural gown and the Foucault pendulum, which hypnotically reveals the Earth's rotation. Beyond all this, of course, there's so much more that, just for the fun of it, pretend you're Bionic Museum Goer and see how a summer's day—with the under-16 crowd—might be spent as follows on a whirlwind tour:

Museum of Natural History, 10 A.M.
Insect Zoo—Live cockroaches, scorpions, praying mantises, crabs, termites, tarantulas (to see the latter "dine" on a live cricket, check daily feeding schedule).
Ode to the Pinnapeds—This ten-minute film, shown continuously, is on the noble, majestic, bewhiskered walrus.
Mexican Dance Masks—Find a Halloween mask among these 185 colorful, sometimes downright ghoulish, designs (p. 22).
Discovery Room (Monday-Thursday, 12-2:30 P.M., Friday-Sunday, 10:30 A.M.-3:30 P.M.)—Some things you'd probably never find in your backyard: porpoise skull, Indian arrowheads, Stone Age ax, whale jawbone, mastodon tooth and more.
The Dog Tower—More than 50 life-sized photographs of *Canis familiaris* enliven this 25-foot-high tower in the new Evolution Hall.
Native Peoples of the Americas—Totem pole, teepee, Eskimo, Indian life groups.
Uncle Beazley (outdoors on Mall)—Although one of the last of the big-time dinosaurs, this particular fiber-glass triceratops is a soft touch whose back, horn, tail and knees are generally aswarm with youngsters.

Museum of History & Technology, 11 A.M.
Ten Years of Sesame Street (June 1-September 3)—Big Bird (below) comes to the

Mall in this salute to the first decade of this award-winning TV series for preschoolers and, as so often has been the case, their parents and older siblings too.
The Bradford Doll House—A 21-room, fully furnished Victorian mansion with some upstairs-downstairs goings on.
A White House Doll House—So named because it was built by a White House gardener for President Grover Cleveland's children.
A Nation of Nations—Drawing cards here are films on sports and show business.
Discovery Corners (check information desks for demonstration time-schedules): Spirit of 1776—the everyday life of a Revolutionary-era citizen-soldier; Electricity—the far-ranging, diversified experiments of Franklin, Bell and Joseph Henry; Rehabilitation—how artificial limbs and other devices help the handicapped.
Vehicle Hall—Early autos, racing cars (*e.g.,* the Winton and two from the Indy 500), carriages, trucks and bicycles.
Musical Instrument Demonstrations (11 A.M., Tuesday-Friday)—Plucked instruments, lutes, guitars (Tuesday); bowed string instruments (Wednesday); woodwinds (Thursday); historical keyboards (Friday)—now, go home and practice!
Telephone Exhibit—Record your voice on antique phones, listen to sounds from outer space, tap central computers for latest news headlines and summaries, world weather and American Stock Exchange data, and dial a "hot line" to the Smithsonian's Curator of Electricity.
Selections from the Chase Manhattan Money Collection—A must for young coin collectors, numismatists of all ages.
Halls of News Reporting and Photography—TV shows, teletype machines, radio broadcasts and nostalgia-filled newsreels.
First Ladies Hall—Gowns worn by the First Ladies from Martha to Rosalynn.

Lunch break, 12 noon
The Carousel—Follow the Wurlitzer band organ music to find the canopied merry-go-round, where a ride costs 35 cents.
Café Hirshhorn (outside Hirshhorn Museum)—Children's box lunch ($1.25) includes sandwich, apple and cookie, but save room for later on when you try the astronauts' freeze-dried ice cream (85 cents) at the Air and Space Museum.
Hirshhorn Sculpture Garden—Go to the bottom of your art class if you can't find Rodin's *Burghers of Calais* and Gargallo's *St. John the Baptist.*
Victorian Garden (behind the Castle)—No picnicking, but a lovely place to smell the flowers and catch the sun.

Arts & Industries Building, 12:45 P.M.
1876: A Centennial Exhibition—Re-creates the mood of Philadelphia International Exposition a hundred years ago; look for the working industrial engines and the Baldwin locomotive.
Tintype Studio—Have your picture taken—for Father's Day?—in the museum shop

in Civil War regalia ($8 for tintype plus $1 for each additional subject).

Air & Space Museum, 1 P.M.
Living Planet—This new half-hour film, shown continuously, takes viewers on an air-and-space flight to faraway corners of the globe; during June, this film and its famous predecessor *To Fly* are shown alternately (25 cents).
Skylab—Walk through orbital workshop model of first U.S. space station, soon to fall to Earth (SMITHSONIAN, May 1979).
Flight Simulators—Two minutes of practice flying in trainer cockpits for anyone tall enough to reach the controls.
Worlds of Tomorrow (begins showing 12:45 weekdays, 10:30 A.M. weekends)—A 30-minute Spacearium presentation about the stars and planets (25 cents).
Flying for Fun Gallery—Hot-air balloons, hang gliders, sailplanes, parachutes, model airplanes, kites and other soarers.
The Family of the Sun—Learn about our solar system to the earthy strains of *Old MacDonald Had a Farm.*
World War I Aviation—This gallery features a diorama of the capture of a Fokker D-VII, which took place near the end of the war near Verdun, France.
Puppet Show—This animated reenactment of the first balloon crossing of the English Channel is shown continuously.

National Collection of Fine Arts, 3 P.M.
Explore Gallery—A patchwork "rug ramp," enticing crawl space and other fascinating objects offer a fine introduction to art in a classy and popular setting.
Patent Pending—Enjoy a teatime snack in this attractive café of the Fine Arts/Portrait Gallery Building (open for snacks 3-3:30 P.M. weekdays, 3:30-4 P.M. weekends; luncheons served earlier).

National Portrait Gallery, 4 P.M.
Haptic Gallery—Hands on, not off, is the rule when examining these specially made casts of sculptures which represent 11 famous people from the Portrait Gallery's permanent collection (labels are set in large-scale type and in Braille).

National Zoo, 5 P.M.
Ling-Ling and *Hsing-Hsing*—These two giant pandas, unhappily still cubless, are the zoo's most famous residents (also look for white Bengal tigers and Atlas lions).
Beaver Valley—A lush new natural habitat for gray seals, timber wolves, California sea lions, beaver, crab-eating fox and North American river otter.
Zoolab (12-3 P.M., Tuesday-Sunday)—Talk to (and learn about) the animals.
Birdlab (12-3 P.M., Friday-Sunday)—What it's like to have, well, a bird in the hand.
Smokey Bear—Need we say more?

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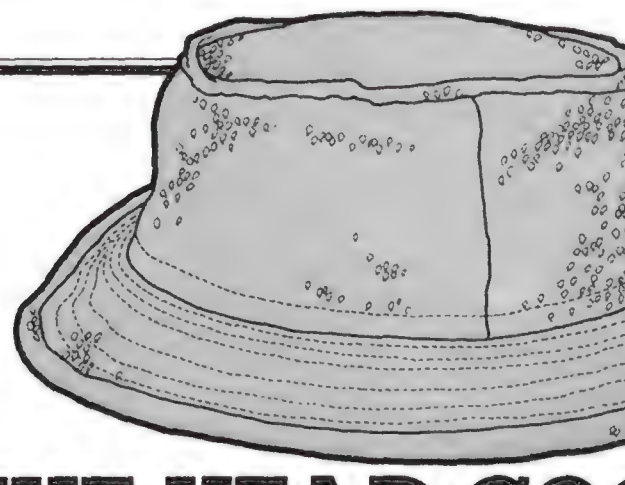

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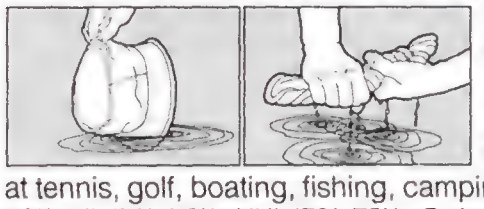

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Summer hours

Smithsonian museums are open from 10 A.M. to 9 P.M., with exception of the Freer, Renwick and National Portrait galleries and the National Collection of Fine Arts, which are open from 10 A.M. to 5:30 P.M. National Zoo buildings are open from 9 A.M. to 6:30 P.M.; the grounds from 6 A.M. to 8 P.M. Anacostia Neighborhood Museum is open weekdays from 10 A.M. to 6 P.M.; weekends from 1 P.M. to 6 P.M.

Membership benefits when visiting the Smithsonian

The Associates Reception Desk, in the castle, is open from 10 A.M. to 4 P.M. daily for registration, event-exhibit information, a special orientation publication and the Associates' *Guide to the Nation's Capital and the Smithsonian Institution.*

The Associates Lounge, in the castle, is open from 10 A.M. to 9 P.M. daily.

The Members' Dining Room, **"The Court,"** in the Museum of Natural History, is open Monday through Friday for breakfast (8:30-10 A.M.), for lunch (11 A.M.-3 P.M.) and for dinner (4:30-7 P.M.) and on weekends for breakfast (8:30-11 A.M.), for brunch (11 A.M.-3 P.M.) and for dinner (4:30-7 P.M.).

For pre-visit information packet, send a postcard or phone the Associates' Reception Center, Smithsonian Institution, Washington, D.C. 20560 (202-381-6264); allow two weeks for receipt.

Special June exhibits and events

National Portrait Gallery
Return to Albion: Americans in England 1760-1940 (through September 16), below.

Henry James, by Jacques-Emile Blanche, is at National Portrait Gallery.

The Whiskey Rebels (June 15-December 9)—Exhibition on the Pennsylvania Whiskey Rebellion of 1794, the first real challenge to federal authority (SMITHSONIAN, June 1974).

Air & Space Museum
Star-Gazers of the Ancient World (June 20, 8 P.M.)—With Gerald S. Hawkins, Science Adviser, U.S. International Communications Agency.
Aerospace Medicine (through October)—Ever-timely exhibit on the health and safety of airline pilots, crews, passengers.

Cooper-Hewitt Museum (New York)
Fantastic Illustration and Design in Britain, 1850-1930 (June 12-September 2)—Among many artists represented in this exhibit of English fantasy are Beatrix Potter, John Tenniel and Walter Crane, whose Little Timmie Timkins is below:

Alvar Aalto (June 12-September 12)—A major retrospective of works by this Finnish architect—one of the giants of the Modern Movement.
Roma Interrotta (June 12-August 12)—This exhibition consists of 12 sections of Giambattista Nolli's 18th-century map of Rome—one of the most influential documents of the city's development—each redesigned by a contemporary architect.

Freer Gallery of Art
Chinese Paintings from the Ch'ing Dynasty [1644-1912] (June 15-December 15)—This exhibition contrasts the intellectual, scholarly tradition with more emotional work of the eccentrics.
Armenian Manuscripts (through November 15)—For sheer beauty of illumination, these selections of 11th- to 17th-century manuscripts are among the finest in the Freer's permanent collection.

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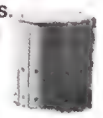

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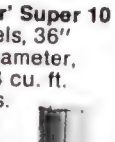

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Mr. and Mrs. Mathews, of Rosemont, New Jersey, are keen organic gardeners. They cultivate a vegetable garden, avoid chemical pesticides and use a Rotocrop compost bin to help keep their soil in peak condition for incredibly high yields.
Mr. Mathews bought the bin as a Christmas present for his wife after seeing a mail-order advertisement, and they use it all the time. "We dump everything in—except bottles and tin cans", says Mr. Mathews..."corn stalks, potato vines, spent lima beans, banana peels, grapefruit skins and coffee grounds. We don't want the garbage man to take such good things away."
And what a harvest of good food they enjoy—they are completely self-sufficient for vegetables. The produce from their garden includes 317 pints of frozen corn, 55 jars of tomato juice, 36 peach baskets of lima beans, 55 baskets of potatoes, plus bushels and bushels of cauliflower, blueberries, strawberries, carrots, peas, celery, onions and other flavorful food crops. They use their compost bin continuously, winter and summer, mixing finished compost into the soil.

Over 600,000 Rotocrop compost bins are in use throughout the world. Gardeners know that they end unsightly heaps, make compost faster and are scientifically designed to turn garden and kitchen wastes into rich, valuable compost **within weeks**—no turning the heap, no unpleasant odors. Make a ton of compost in one season!

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Hirshhorn Museum & Sculpture Garden
Roger Corman: Hollywood's Wild Angel (June 7 and 8, 8 P.M.)—Christian Blackwood's documentary on the master of campy horror-exploitation films.
Directions (June 14-September 3)—This exhibition focuses on five of the many directions that characterize American art today: Brute Sculpture, Imitations, Fictions, Eclectic Surfaces and Shrines.
The Rime of the Ancient Mariner (June 14, 15, 8 P.M.)—In a new film, Orson Welles reads Coleridge's poem, with collage animation of Doré prints by Larry Jordan.
Grant Mudford: Photographs (June 28-September 9)—This California photographer's first one-man museum exhibition.

Museum of History & Technology
Daum: 100 Years of Glass and Crystal (June 9-August 26)—A hundred objects of early vases, art nouveau works, art deco lamps and crystal—all made by this Nancy, France, firm since 1875.
Einstein: A Centenary Exhibition (until April 1980; SMITHSONIAN, February 1979).

National Collection of Fine Arts
Western Arts (June 8-September 3)—This juried exhibition of 63 contemporary works features 28 artists from 13 different Western states (SMITHSONIAN, April 1979).
Children's Day, NCFA (June 9, 10 A.M.-4 P.M.)—This annual day for families ties into the above Western arts exhibition with one titled *The Feel of the West.*

Renwick Gallery
Child's Play (June 15-September 9)—Educational toys commemorate UNESCO's International Year of the Child.
Buildings Reborn: New Uses, Old Places (through August 19).

Smithsonian subscription events
(202-381-5157)

MNH's Baird Auditorium
Margaret Mead: Portrait of a Friend (June 12, 8 P.M.)—This 1977 film captures the great anthropologist at the American Museum of Natural History and in Central Park shortly before her death.
Update on Tell Jemmeh (June 13, 8 P.M.)—Gus Van Beek, as Curator of Old World Archaeology, directed the Smithsonian's Tell Jemmeh dig from 1970 until its completion last year; his lecture reveals some of the astonishing structures unearthed at site in the western Negev desert on border of ancient Palestine and Egypt.

MHT's Carmichael Auditorium
Victorian Horticulture and Floriculture (June 16, 9 A.M.-4:30 P.M.)—Illustrated lectures and lecture/demonstrations.

Sixth Annual Boomerang Festival

This Smithsonian-sponsored competition, open to the public, takes place on June 9 (rain date June 16) on the Polo Field, West Potomac Park, Washton, D.C. Registration for novices is at 1:30 P.M.; for teams, advanced throwers: 2:30 P.M.

Radio Smithsonian

This music-and-conversation program is broadcast weekly on approximately 50 stations across the country; for times, consult local public-radio stations:

The Smithsonian Chamber Players (week of June 3)—Music of the Baroque, including Bach's Suite No. 1 in C major.

Are Deserts Spreading? (week of June 10)—Dangers, challenges of desertification.

American Realism 1979 (week of June 10)—Is the revival of realism a rejection of abstract art? (with John Canaday).

From Penzance to Pinafore (week of June 17)—A celebration of the music of Gilbert and Sullivan with Reginald Allen, foremost U.S. authority on the popular team.

Is the Universe Comprehensible?" (week of June 24)—Nuclear physicist John A. Wheeler, authority on Einstein's theories.

The Urban Landscape of Richard Estes (week of June 24)—A leading figure in triumphant revival of realism in American painting.

Smithsonian Institution Traveling Exhibition Service

SITES circulates exhibitions to hundreds of cities outside Washington, D.C. To sponsor a show in your community, write to Eileen Harakal, SITES, Smithsonian Institution, Washington, D.C. 20560. Here are some June openings:

Phoenix (June 2-July 1)—*Blacks in the Westward Movement,* Federal Building.

Washington, D.C. (June 16-July 15)—*New American Monotypes,* The Phillips Collection.

Atlanta (June 16-July 15)—*Subways, An Underground Exhibition,* Handshake Gallery.

Chicago (June 2-September 2)—*Treasures of Cyprus,* Field Museum of Natural History.

New York (June 23-July 22)—*Audiences of the Moon,* Hayden Planetarium.

Nashville (June 9-July 8)—*The Art of Scientific Illustration,* Botanical Gardens.

Charleston, West Virginia (June 23-July 22)—*Biological Photography,* Sunrise Foundation, Inc.

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SMITH-6

By John V. Dennis

Are they birds or do we see W. C. Fields in triple vision?

A few years ago, in response to an article about birds in *Time,* I wrote a letter to the editors of that magazine, which they duly published under the headline: "Tits on a toot."

My letter merely had to do with the propensity of chickadeelike British birds, called tits, to overindulge in the spiritous liquors naturally produced by overripe berries. It took me a while to recover from that headline, but eventually I resumed my research on inebriation among animals. I can now report on the results of my investigations; they would make Carry Nation roll over in her grave.

The facts are that virtually any plant material containing sugar—fruits, berries, sap, nectar—can under certain circumstances ferment into tolerably high-proof booze, and creatures of all kinds occasionally get a big kick out of their close encounters with it. And like humans, if there is an abundant supply, they are apt to get utterly blotto.

In Australia, parrots imbibe the rich nectar of eucalyptus flowers till they fall out of the trees. In North America, ruffed grouse, in the autumn, go through what is called the "crazy season," during which they fly into windows and windshields. It has now been revealed that this berserk behavior results from their visiting orchards to eat fermenting fruit; the birds are simply smashed on applejack. Robins and cedar waxwings, gobbling up old apples, will flutter wildly, fall, and lie on their backs with legs kicking.

In Asia, humans attach cups to the trunks of palm trees to collect sap that ferments and turns into wine or "toddy." The bar is thus always open, and animals are frequent patrons. In India, civets—small mammals—are such dedicated drinkers of this palm liquor that they are known as "toddy cats." Fruit bats, wrote one observer, "often pass the night drinking the toddy from cocoanut trees, which results either in their returning home in the early morning in a state of extreme and riotous intoxication, or in being found the next day at the foot of the trees, sleeping off the effects of their midnight debauch."

In the United States, alcoholism in the suburbs is a problem for creatures other than suburbanites. One common lawn shrub, buddleia, is strong beer for butterflies, and another, pyracantha, produces red berries that hold the attraction for robins that a bottle of 90 proof bourbon holds for certain humans.

There is little evidence about whether large animals suffer morning-after blues. But drunks sometimes do get into trouble, and animals are no exception. Birds that have overindulged fly into plate-glass windows, often with fatal results or, fluttering on the ground, fall prey to teetotaling cats.

Strange cases involving bees are reported from time to time in Britain. These insects, which lead otherwise exemplary lives, occasionally get so drunk that they fall stupefied from the flowers on which they feed and are then decapitated by predatory wasps.

But there are other creatures that appear to hold their liquor very well, evidently having evolved strong constitutions built up through generations of tippling. A rather common American woodpecker, the sapsucker, not only imbibes heavily but also functions as a kind of avian saloonkeeper. Sapsuckers drill neat rows of holes in limbs and trunks of trees; as the sap begins to flow the birds drink deep of the liquid. During warm spells the sap sometimes ferments, and the sapsuckers are joined by other birds, insects and small mammals that are quick to recognize an opportunity for a free drink. Back in 1915, the magazine *Bird-Lore* reported on a party of this kind that took place among sapsucker drillings in gray birch trees in Maine. Hummingbirds that had been imbibing too freely were performing strange aerial acrobatics and seemed totally demoralized. Squirrels, after feeding at the holes, were logy and stupid. As for the bartenders, the sapsuckers themselves—although on occasion they have passed out cold—in this case showed no adverse effects.

Perhaps I should be able to draw some pointed moral from this excursion into animal drinking habits that would bring joy into the presumably cheerless lives of temperance workers. Unfortunately, the animals do not seem to supply us with an object lesson. Those that imbibe freely are for the most part successful species, and except for occasional deaths through predation and accident, they seem to thrive on their bad habits.

There is one story, though, that might give a drinker pause. Many gardeners place shallow beer-filled containers in their yards to trap slugs, snails and cutworms. Because of their great fondness for beer, the unfortunate creatures are lured to the containers; once they have drunk sufficiently, they fall in and die.

Could there be a more poignant example of drowning one's self in alcohol?

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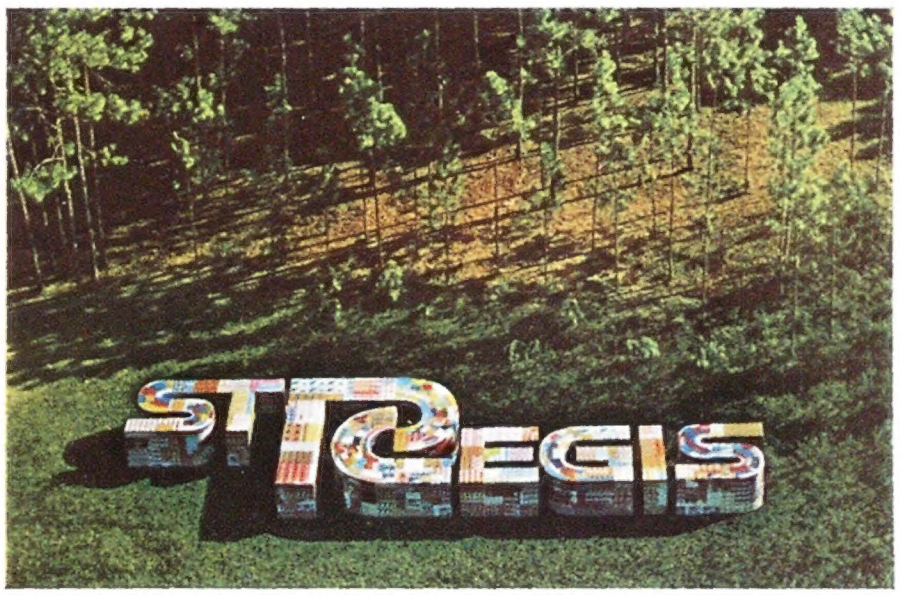

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